Miami-Dade County Grade Separation Study

Prepared for the Miami-Dade MPO

July 2005

Grade Separation Study

Prepared for:
Miami-Dade County
Metropolitan Planning Organization

Submitted by:
The Corradino Group
4055 NW 97 Avenue
Miami, FL 33178

June 2005

Table of Contents

1 INTRODUCTION

Over the years it has been found that freeway type interchanges on arterial streets do not work for a number of reasons. First, arterials that warrant this type of improvement are normally in very urbanized areas. A freeway type interchange requires a great deal of right-of-way and would generally require taking all of the property and the associated developments to accommodate the interchange. Secondly, full grade separation cuts off access to adjoining properties, which causes a great deal of local opposition to the project. Thirdly, the overpass structure will tend to overpower the surrounding community, causing community opposition from an aesthetic point of view. Finally, as everyone is beginning to realize, continuous flow operations tend to overpower the surrounding local streets. Sometimes, the feeder street can pump enough volume into the continuous flow ramp to take advantage of the capacity. Likewise, if the continuous flow facility is moving at capacity, there can be a problem downstream with the local streets being unable to accommodate the free flow movement.

There are currently a number of locations within Miami-Dade County where arterial to arterial grade separations exists. There are two grade separations on Miami Beach that were designed to accommodate left turns. They are located at 63rd Street and Indian Creek Drive and at Fifth Street and Alton Road. There is a single point interchange grade separation in Aventura that was recently constructed. It is a very large imposing structure at Biscayne Boulevard and

Transportation professionals have sought ways to minimize the overpowering nature and negative impacts of freeway interchanges. This has been done by simply removing some of the movements in an intersection from the signal cycle. This can be done by proving a grade separation or ramp for either the through movements, or for the left-turn movements.

This report examines high volume intersections throughout Miami-Dade County that could benefit from construction of what is now being termed, a “continuous flow intersection”. There are numerous concepts in the transportation community for this type of improvement. A continuous flow intersection removes the heaviest flow movement from the signal cycle, which provides more green time for all of the other movements in the intersection.

1.1 Grade Separation Concepts

Grade separations represent a compromise between the freeway type interchange and a typical urban intersection. There are four options for providing grade separation. The first one to be discussed is grade separating the through movement on the heaviest volume street and maintaining the secondary through movement and all left and right turning movements at grade. Figure 1-1 illustrates a grade separation that provides continuous flow for the main through movement.

Figure 1-1

A second grade separation type is very similar to the first, except that instead of providing an over crossing, the continuous flow through lanes would be placed below grade in a cut-and-cover section as shown in Figure 1-2.

A third grade separation entails removing from one to four of the left turn movements from the intersection. There are a number of intersection designs that separate the turning movements and just keep the two opposing through movements at grade. These are fairly common in the urban environment and are frequently seen as fly-overs. Figure 1-2 shows a grade separation that provides alternating flow for at opposing left turn movements.

A fourth grade separation option elevates a quadrant of the street (northbound and eastbound, southbound and westbound, northbound and westbound or southbound and eastbound.) What this separation does is create two one-way pairs, simplifying pairs of turning movements. All movements still have to stop, but all turning movements are accommodated with the green-time provided for the through traffic. This design provides the options for managing the location of the impacts upon the property adjacent to the grade separation. Figure 1-3 illustrates this form of grade separation.

Figure 1-3

1.2 Non-Grade Separated Modifications

There are a number of unconventional intersection designs that can be used to improve traffic flow in an intersection that do not involve grade separation. They involve the same principle as a grade separation, which is the removal of minor movements in an intersection to improve the flow of the major movements. They are deemed unconventional by traffic engineers because they incorporate movement restrictions that are generally allowed in a standard four leg at-grade intersection. The following intersection designs are not a part of this study, but are presented below for future consideration for those intersections that are not selected for grade separations.

1.2.1 Median U-Turn Intersection

Figure 1-4 illustrates the concept of a median u-turn intersection, which attempts to convert all major roadway left turn movements to right turns at the intersection, by using uni-directional median crossovers along the median of the major roadway. The U-turn allows drivers to complete the direction change as shown in Figure 1-4. This modification allows more green time to be given to the major roadway by eliminating the left turn cycle. This design is ideal for an intersection with light left turn movements.

There are two major problems with this design. First is the conflict of the U-turning traffic into on-coming traffic, followed by a multi-lane weave to make the right turn and secondly the design requires very wide medians.

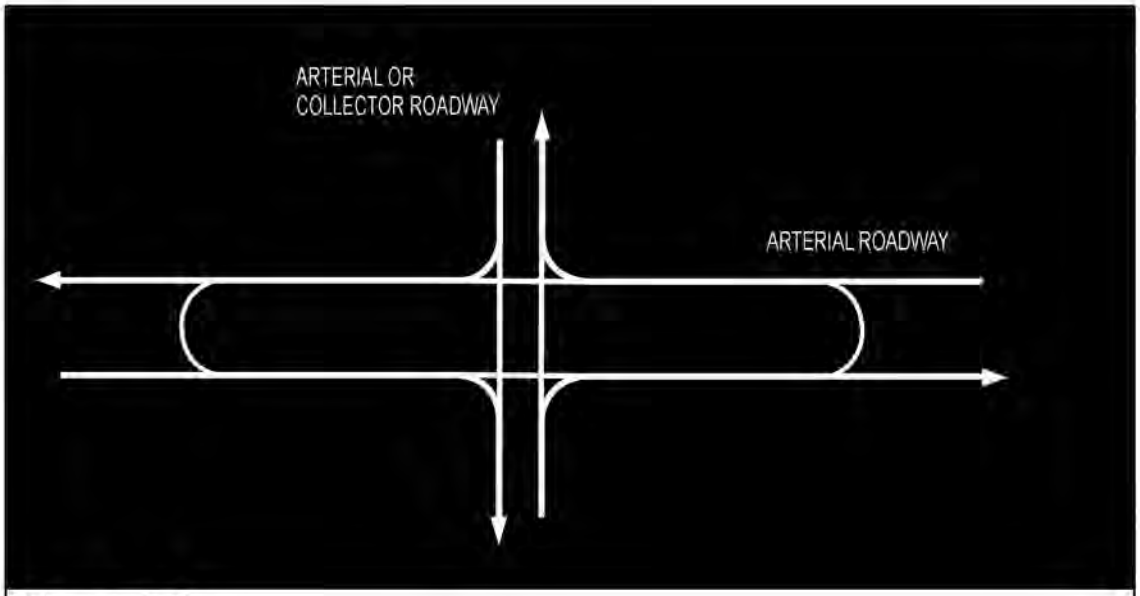


Figure 1-4

1.2.2 Superstreet Median U-Turn

This design cuts off the through traffic on the cross street, but allows left turns from the major street, so it is ideal for intersections with light through traffic on the secondary arterial. Through trips on the secondary street are required to turn right on to the major arterial, then U-turn at the median and turn right again on to the secondary street. This operational pattern is shown in Figure 1-5. It should be noted that this intersection is only theoretical and has never been constructed.

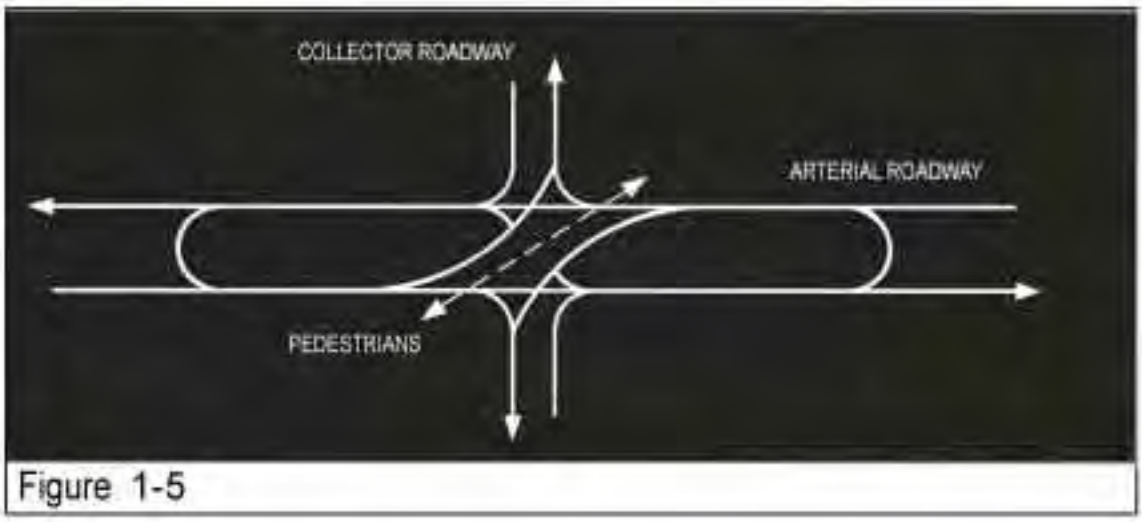


Figure 1-5

1.2.3 Single Quadrant Roadway Intersection

The single quadrant intersection removes all left turn movement from the primary intersections and moves them to secondary intersections removed from the primary intersection. This concept allows the primary intersection to operate on a two-phase cycle. The left turn movements at the secondary intersection must be synchronized so that the left turn movement over laps with the corresponding through movement in the main intersection. Figure 1-6 diagrams this concept. This concept is ideal for streets without a wide median, which both of the U-turn designs require.

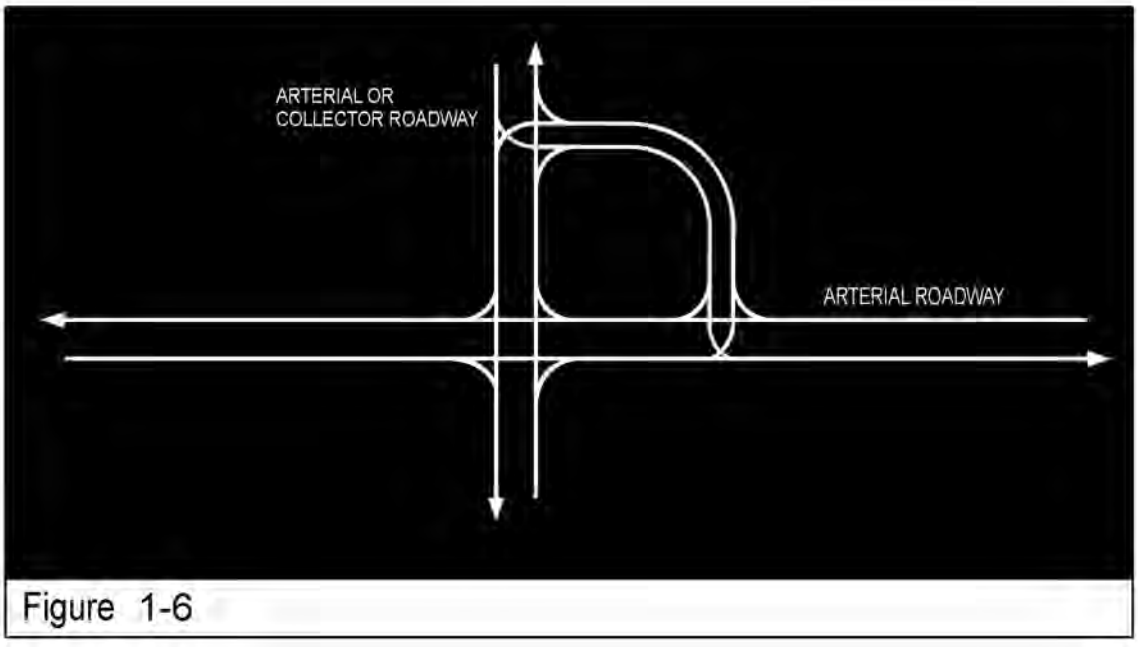


Figure 1-6

1.2.4 Jug Handle Intersection

This configuration is a design that incorporates separate turning roadways similar to the quadrant intersection. The principal is to remove all left and right turning movements from the main intersection by shifting them to an adjacent intersection. This is a step up from the quadrant intersection because left turns are removed from the adjacent intersection on the primary arterial by using two quadrants for the turning movements. This alternative does not (unlike the single quadrant intersection) remove left turns from the secondary street from the primary intersection. A full quadrant jug handle intersection would remove all left turn movements from the intersection Figure 1-7 illustrates the two jug handle configuration.

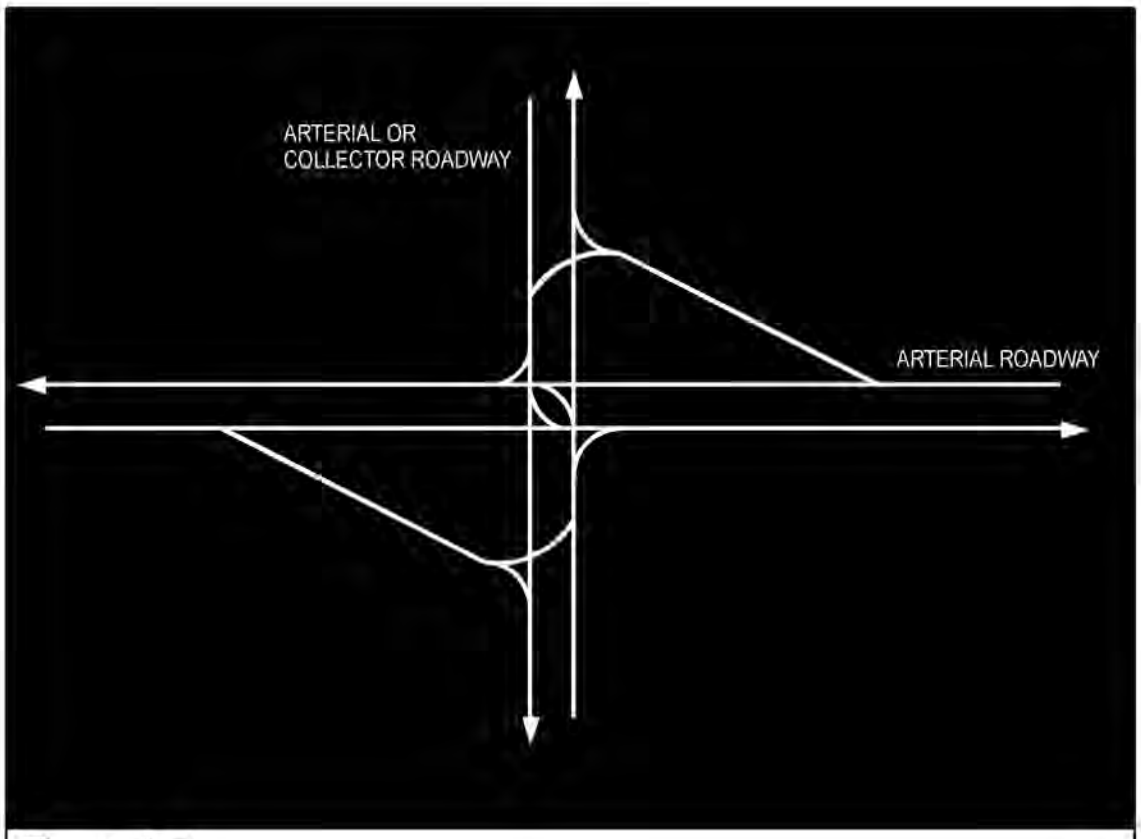


Figure 1-7

1.2.5 Continuous Flow Intersection

This idea is a complex, unconventional design that relies heavily on channelization. Left turn traffic is moved from all approaches to the main intersection across opposing traffic lanes prior to the main intersection, as illustrated in Figure 1-8. Left turns are completed simultaneously and unopposed with their accompanying and opposing through movements. The relocation of the left turn lanes allows the main intersection to operate on a two phase cycle. Under high volume conditions, the left turn cross over movement prior to the intersection should also be signalized. This secondary signal should be coordinated with the signal at the main intersection. (Crossovers go with the cross traffic on the secondary street.) This design does not accommodate u-turns. This concept has be applied to all four approaches to the intersection.

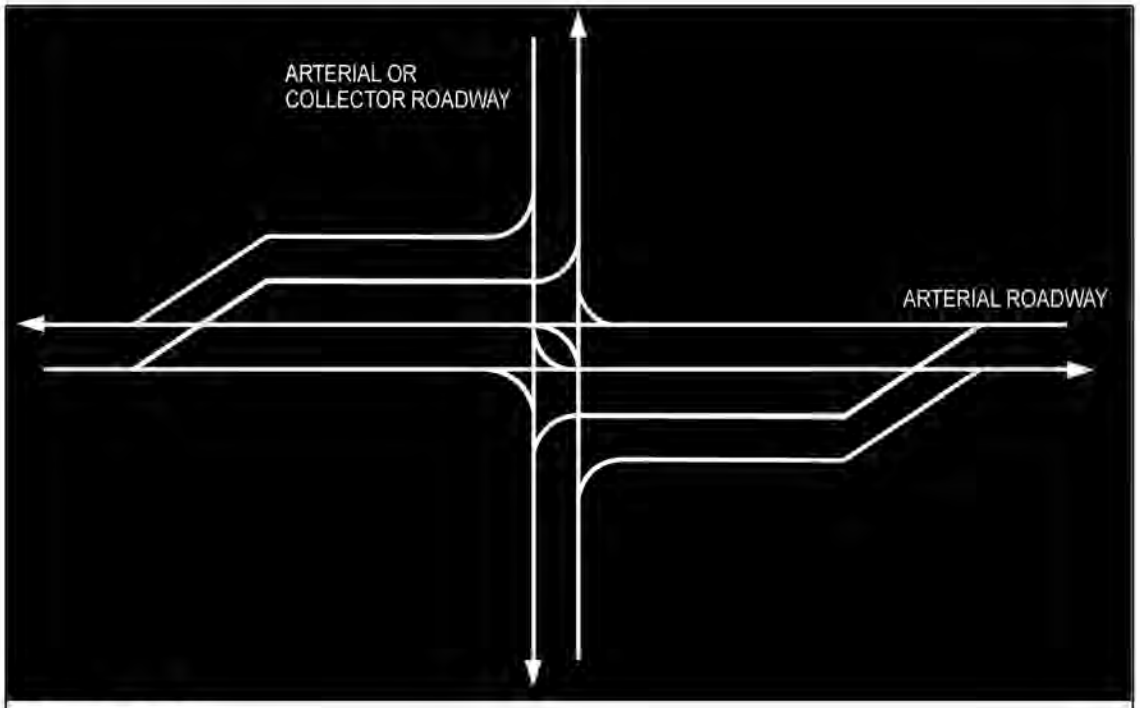


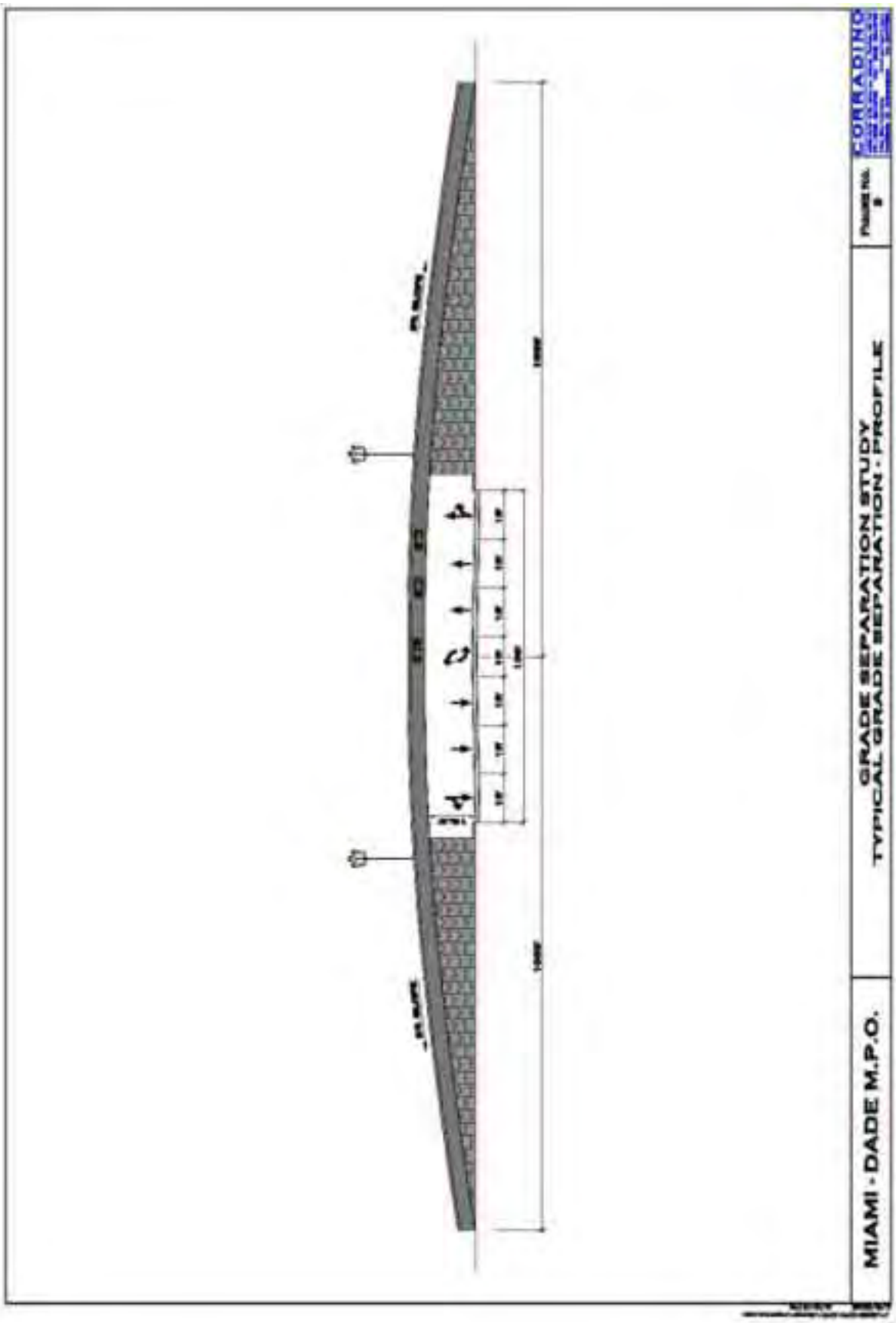
Figure 1-8

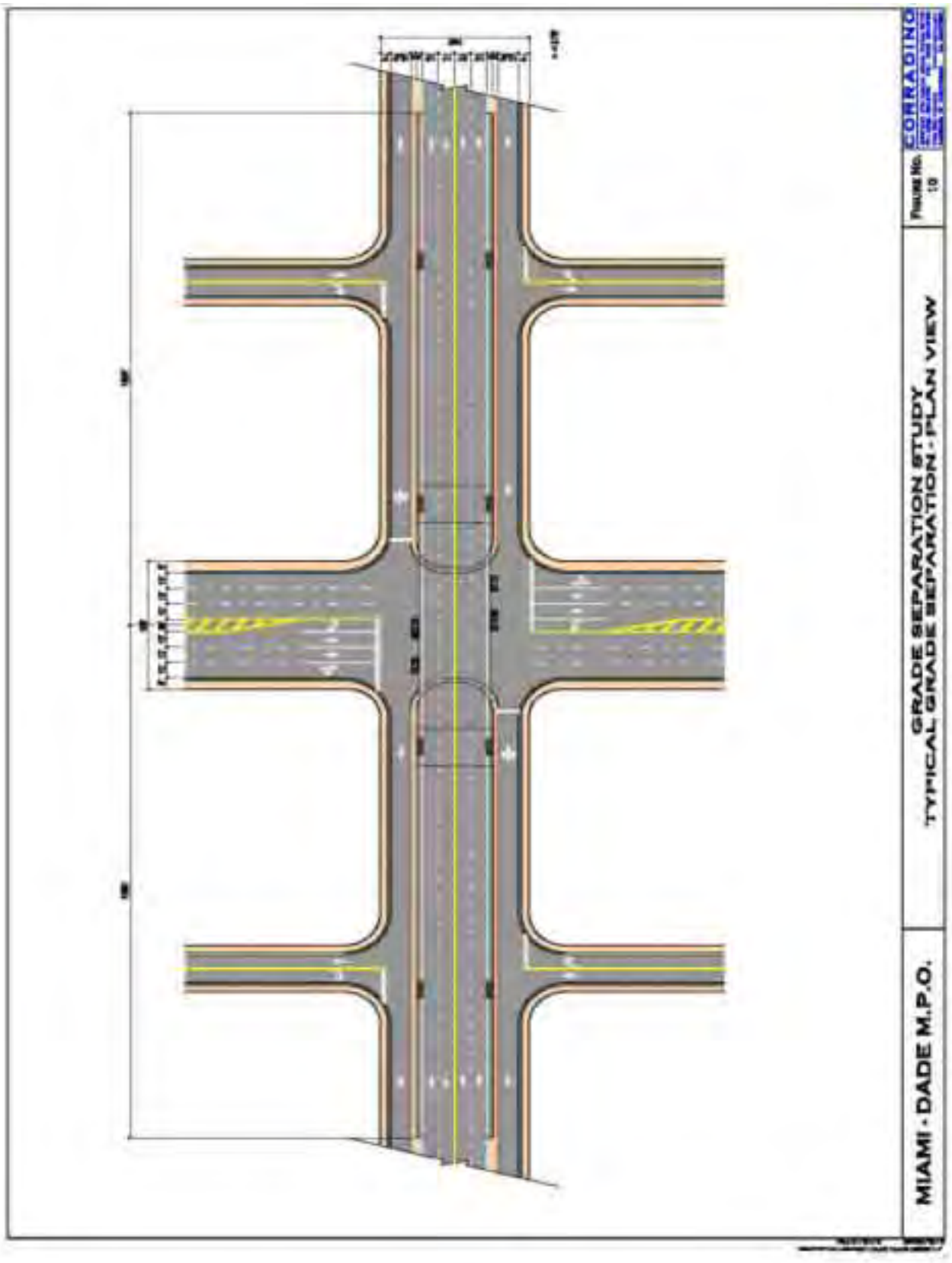
1.3 Typical Grade Separation Applied in Study

Detailed traffic analysis and design efforts will be needed to determine exactly what form of grade separation will work best for each intersection. For the purpose of this study a generic grade separation has been designed and will be applied against all intersections. The impacts of grade separation at each intersection are the result of applying this generic design. Modifications to the design can lessen the impacts.

Figure 1-9 shows the profile of a typical grade separation. At a five percent grade, the grade separation would need 1000' to return to grade. The clearance under the bridge was held at 16.5'. The structure depth was calculated to be 9' in order to span a minimum of 100'. Thus, the typical grade separation will need to be 2,100 feet long from the points where the structure ties into the pavement at both ends of the structure.

Figure 1-10 shows the typical plan view of the grade separation. The plan view shown requires a minimum of 100' right-of-way and includes 7' sidewalks on both sides of the street, all 11' lanes with two through lanes in each direction on the flyover and one 13.5 foot lane in each direction at-grade to accommodate local access and turning movements. The plan also includes 5.25' horizontal clearance from the bridge structure and a 5.25' shoulder in the bridge section.


MIAMI - DADE M.P.O.
GRADE SEPARATION STUDY
TYPICAL GRADE SEPARATION - PROFILE


CORRADINO
GRADE SEPARATION STUDY
TYPICAL GRADE SEPARATION - PLAN VIEW
MIAMI - DADE M.P.O.

2 TIER I ALTERNATIVES

The initial set of intersections to be considered for grade separation were developed by sending a letter requesting nominations to members of the Transportation Planning Committee of the Miami Dade County MPO. The following is the List of TPC members:

- Aviation Department
- City of Hialeah
- City of Miami
- City of Miami Beach
- City of Miami Gardens
- City of North Miami
- Dade League of Cities
- Department of Environmental Resources Management (DERM)
- Department of Planning and Zoning
- Department of Public Works
- Florida Department of Environmental Protection (FDEP)
- Florida Department of Transportation (FDOT)
- Metropolitan Planning Organization (MPO)
- Miami-Dade Transit (MDT)
- Miami-Dade Expressway Authority (MDX)
- Miami-Dade County School Board
- Seaport Department
- South Florida Regional Planning Council (SFRPC)
- South Florida Regional Transportation Authority (SFRTA)

Also a letter was transmitted to those municipalities with a population of 100,000 people or more requesting their participation in the study by nominating intersections that would be condiered in the study. The cities contacted were:

- Aventura,
- Coral Gables,
- Doral,
- Hialeah Gardens,
- Homestead,
- Key Biscayne,
- Miami Shores,
- Miami Springs,
- Miami Lakes,
- North Miami Beach,
- Opa-locka,
- Palmetto Bay,
- Pinecrest,
- South Miami,
- Sunny Isles Beach,

All nominated intersections were included in the Tier I screening.

Additionally, the 2003 FDOT traffic count data was examined and the top 31 non-freeway intersections were examined. Table 2-1 shows the top 31 locations (based on FDOT 2003 counts), the traffic on the cross street (if available) and the total volume of traffic that would use the intersection. The intersection of NW 87th Avenue and NW 12th Street is not in the table because no counts were readily available and original counts were outside of the scope of this study

2.1 SW 8th Street at SW 42nd Avenue

SW 8th Street is a major east west arterial that runs across the southern tip of the Florida Peninsula. It is under State jurisdiction as US 41. SW 42nd Avenue is a major north south arterial that crosses the entire County. It is also under State jurisdiction as SR 953. Two-way Average Annual Daily Traffic (AADT) volumes on SW 42 Avenue are in the range of 50,000 and volumes on SW 8 Street are in the range of 46,500. Daily volumes through the intersection are approximately 96,500. At this location both SW 8 Street and the north leg of SW 42 Avenue are in a 100 foot ROW. The intersection diagram shows that all approaches to this intersection consist of two through lanes and a left turn lane. All directions provide for right turn lane except for the south leg of SW 42 Avenue.

Figure 2-1 is a compilation of photos accompanying the aerial photograph of the intersection showing the land uses adjacent to the intersection. All approaches to the intersection are adjacent to commercial land uses, surrounded by large parking lots. Car dealerships sit on both quadrants of the north side of the street; a drugstore and apartments occupy the southwest quadrant of the intersection, and a gas station and fast food restaurant occupy the southeast quadrant.

The implementation of a grade separation at intersection requires approach ramps of 1000 feet long in order to provide adequate clearance over the street being crossed. Normally the street with the highest volume would be provided with the through lanes. Thus the 1000 foot ramp will impact the cross streets along the arterial. Along 42nd Avenue the blocks are only 200 to 250 feet long and are not suitable for construction of north/south grade separation. The east/west blocks along SW 8 Street are 600 feet long and are of sufficient length to accommodate an east/west grade separation.

Besides improving traffic flow, the other key reason for considering the installation of a grade separation is to improve safety. Table 2-2 shows the three-year history of accidents for this intersection. There have been no fatal crashes at this location. There has been an average of 25 crashes per year, and an average of ten injuries per year at the intersection of SW 8th Street and 42nd Avenue.

Table 2-1
Comparative Traffic Volumes at Intersections (2003 FDOT Traffic Counts)

Report Section	Intersection	Main AADT	Secondary AADT	Total AADT	Comments
2.7	US 1 @ SW 27th Ave	101,500	29,000	130,500	Nominated
	Julia Tuttle @ Alton	99,000			Already Separated
2.11	US 1 @ SW 57th Ave.	89,000	22,000	111,000	Nominated
2.15	Kendall @ SW 127th Ave	84,500			
2.10	US 1 @ Bird Rd.	84,000	49,500	133,500	Nominated
	LeJeune @ NW 25th St.	82,500			Already Separated
	SW 8th St. @ 127th Ave.	75,000			
	US 1 @ Coral Reef Dr.	74,000	39,000	113,000	
2.16	US 1 @ SW 136th Street	74,000	12,500	86,500	Nominated
	Kendall @ SW 107th Ave	73,000	33,500	106,500	
	US 1 @ NE 192nd St.	71,500	31,500	103,000	
	Kendall @ SW 137th Ave	69,500	42,500	112,000	ADD
2.9	US 1 @ SW 104th Street	68,000	11,100	79,100	Nominated
	US 1 @ NE 186th St	65,500	34,500	100,000	
	Bird Rd. @ SW 74th Ave.	65,500			
2.13	US 441 @ Ives Dairy Rd.	65,500			Added
	NW 107th Ave @ Flagler	64,500	53,000	117,500	
	NW 2nd Ave @ 183rd St.	63,000	34,500	97,500	
2.3	NW 36th St @ Milam Dairy	62,500	32,000	94,500	Nominated
	NW 27th Ave. @ 135th St	59,500	34,000	93,500	Future Metrorail
2.8	SW 8th St @ 87th Ave	58,000	37,500	95,500	Nominated
	Flagler @ 72nd Ave.	57,000	31,500	88,500	
2.4	NE 167th St @ NE 6th Ave.	56,500	20,400	76,900	Nominated
	NW 27th Ave @ Flagler	55,500	37,500	93,000	
	Bird Rd @ SW 87th Ave	54,500	29,000	83,500	
2.5	Biscayne Blvd @ NE 163rd	54,200	44,500	98,700	Nominated
2.6	SW 8th St. @ 107th Ave	54,000	51,000	105,000	Nominated
	Flagler @ 87th Ave	54,000	41,500	95,500	
	Bird Rd. @ SW 107th Ave	54,000	30,500	84,500	
2.2	LeJeune @ Flagler	53,500	40,500	94,000	Nominated
2.14	Red Rd @ NW 135th St.	51,000	32,000	83,000	Added
2.1	LeJeune @ SW 8th St.	50,000	46,500	96,500	Nominated
2.17	SW 117thAve@SW 152nd St	41,000	22,556	63,556	Nominated

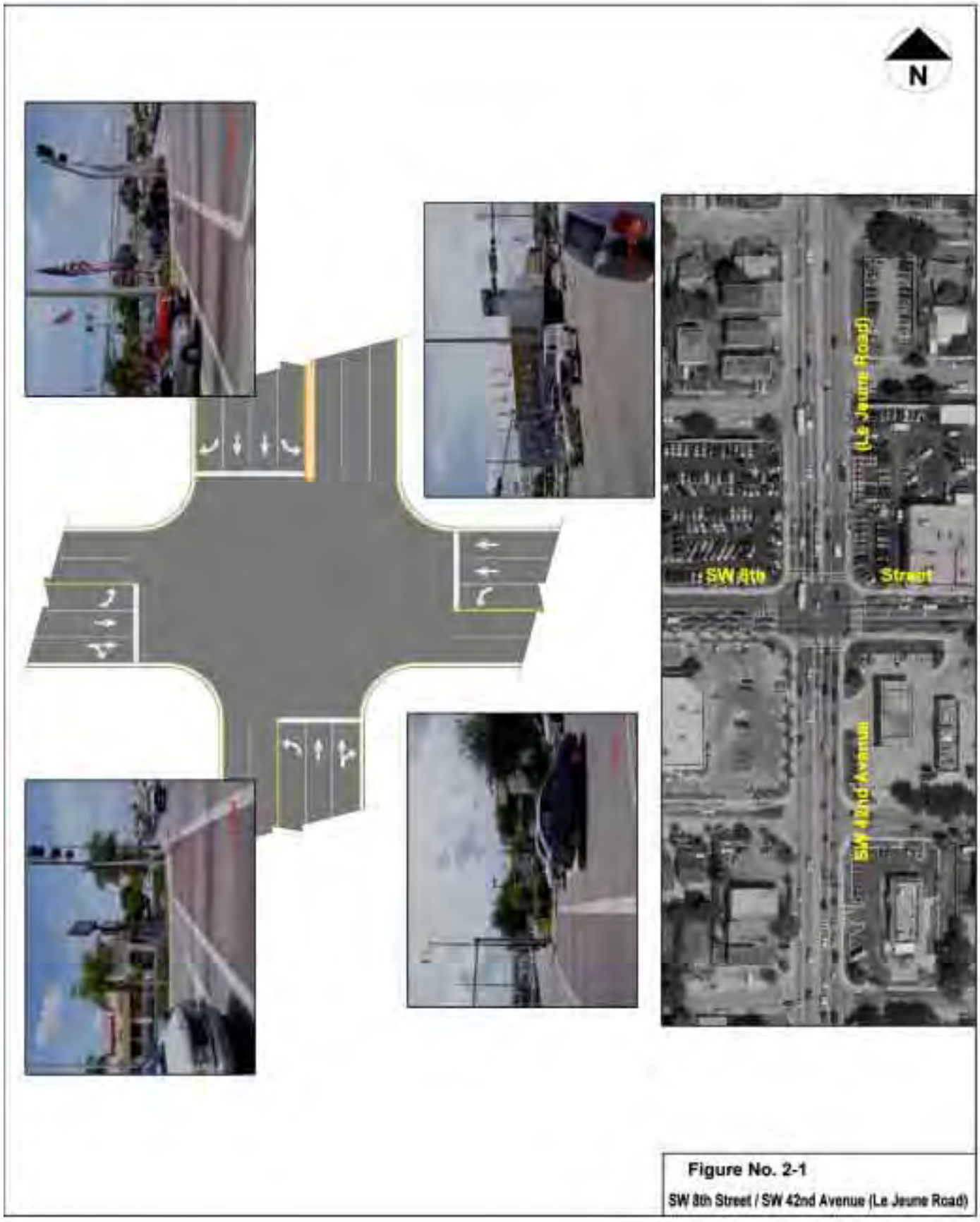


Figure No. 2-1
SW 8th Street / SW 42nd Avenue (Le Jeune Road)

Table 2-2
Accident History
SW 8th Street and 42nd Avenue

	Fatal Crash Statistics			Injury Crash Statistics		Property Damage Only	Totals		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	6	8	19	25	0	9
2002	0	0	0	7	13	14	21	0	8
2003	0	0	0	8	30	21	29	0	13
Total	0	0	0	21	49	54	75	0	30

2.2 W 42nd Avenue and Flagler Street

W 42nd Avenue (LeJeune Rd) is a 6-lane facility at this location and Flagler Street is a 4-lane facility. W 42nd Avenue is a State facility, SR 953 as is Flagler Street, SR 968. All approaches to this intersection have protected left-turn lanes. LeJeune has a 100 foot right-of-way. W 42 Avenue handles about 53,500 two-way AADT and Flagler Street handles about 40,500 two-way AADT. The intersection handles 94,000 vehicles a day.

When considering the location of a grade separation the blocks on the west side of W 42nd Street north of Flagler Street are 250' deep, whereas the block on the east side of the intersection is 600' deep. The blocks south of Flagler Street are 500' long. The blocks along the Flagler Street on the west side of 42nd Avenue are 600' long, but the blocks on the east side are only 200' deep.

Table 2-3 shows the accident history for the intersection of W 42nd Avenue and Flagler Street. During the previous three years there was only one accident with a fatality, but eight people were injured in that crash. Historically there has been an average of 34 crashes per year at this intersection with an average of 24 injuries per year.

Table 2-3
Accident History
W 42nd Avenue and Flagler Street

	Fatal Crash Statistics			Injury Crash Statistics		Property Damage Only	Totals		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	1	1	8	13	20	23	37	1	28
2002	0	0	0	9	17	19	28	0	17
2003	0	0	0	15	28	22	37	0	28
Total	1	1	8	37	65	64	102	1	73

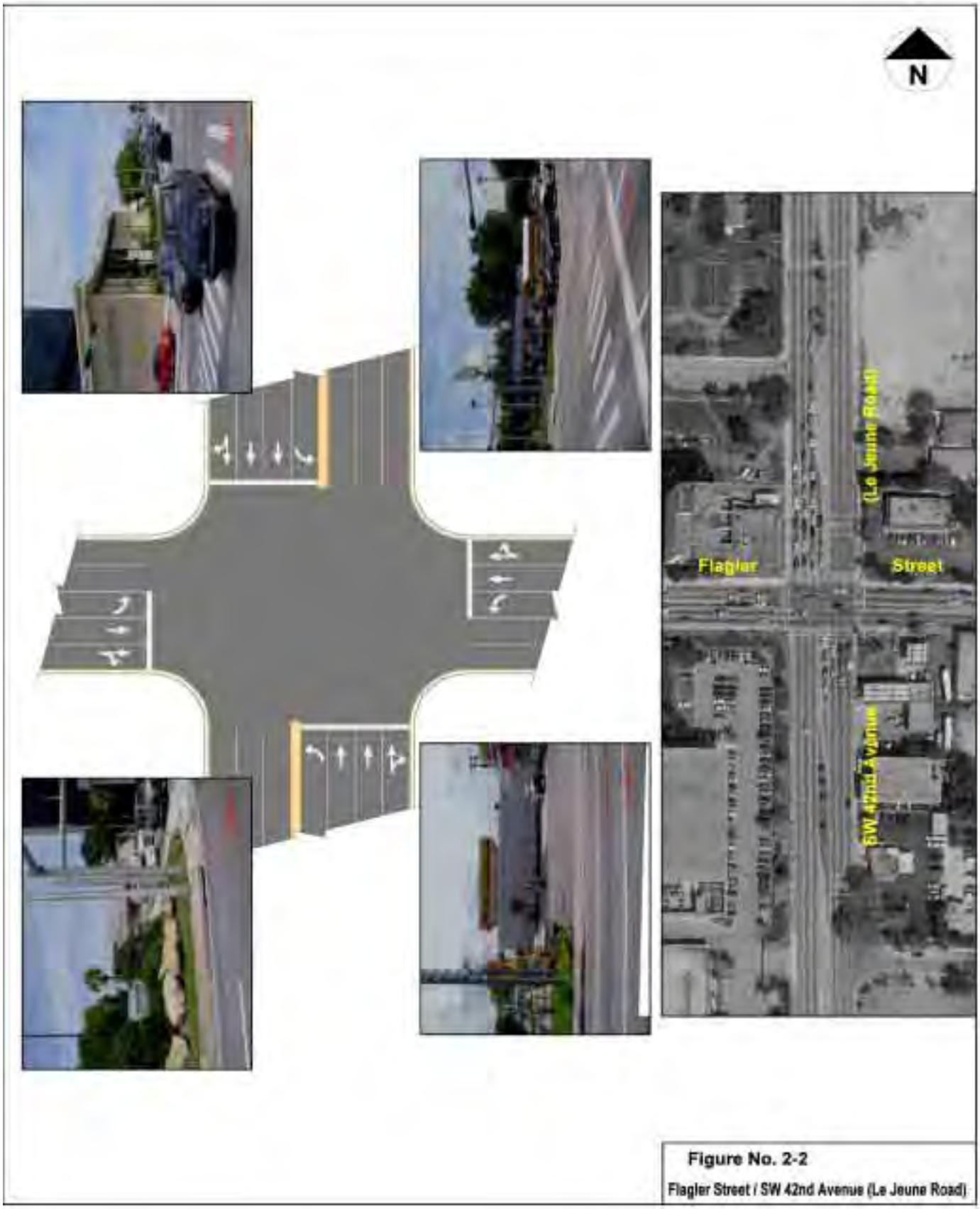


Figure No. 2-2
Flagler Street / SW 42nd Avenue (Le Jeune Road)

As can be seen in Figure 2-2 from the series of photos and the aerials the intersection is surrounded by commercial uses. Office buildings occupy both of the western quadrants of the intersection. The northeast quadrant is the site of a fast food restaurant and the southeast quadrant is the location of a gas station.

2.3 NW 72nd Avenue at NW 36th Street

NW 72nd Avenue is a major north-south State facility – SR 969 that crosses another major NW 36th Street, which is another State facility – SR 948.
All approaches to this intersection provide four through lanes and three of the four approaches have two protected left-turn lanes. NW 36th Street at this location has 150 foot right-of-way. Two-way AADT volumes at this intersection along NW 72 Avenue are in the range of 32,000 vehicles. Traffic on NW 36th Street is much higher, with AADT of 62,500 vehicles. The intersection handles about 94,500 vehicles per day.

Figure 2-3 consists of photographs accompanying the aerial photograph of the intersection showing the adjacent land use. Gas stations occupy both of the western quadrants of the intersections, while the County jail occupies the northeast quadrant and its food center, and Miami-Dade Public works garage occupy the southeastern quadrant of the intersection.

This intersection is surrounded by very large blocks which will facilitate a grade separation. The blocks along the north side of NW 72nd Avenue are 700' deep. The block south of NW 36th Street crosses a canal that is 400' south of the intersection, but the block is actually 550' long. The blocks on the west side of NW 72nd Avenue are 1,200' long and the blocks along NW 36th Street east of the intersection run into the approach to the grade separation over the FEC rail yard.

Table 2-4 shows that during the previous three years there has only been one fatality accident at the intersection of NW 72 Avenue and NW 36th Street. During the same time frame, there has been an average of 36 crashes per year with 18 injuries per year.

Table 2-4
Accident History
NW 72 Avenue and NW 36th Street

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	15	23	21	36	0	23
2002	1	1	1	13	17	30	44	1	18
2003	0	0	0	8	14	21	29	0	14
Total	1	1	1	36	54	72	109	1	55

Figure No. 2-3
SW 72nd Avenue (Miam Dairy Road) / SW 36th Street

2.4 NE 6th Avenue at NE 167th Street

NE 6th Avenue approaches to the intersection consist of two through lanes and a protected left turn lane and the NE 167th Street approaches consist of three through lanes and a protected left turn lane. NE 6th Avenue is a State facility, SR 915 and NE 167th is also a State facility, SR 826. NE 167th Street has 100 foot right-of-way. NE 6th Avenue handles about 20,400 AADT and NE 167th Street handles about 56,500 AADT. The intersection handles about 76,900 vehicles per day.

Figure 2-4 shows that three of the corners of this intersection are occupied by mixed commercial developments. The northeast corner is occupied by a gas station adjacent to a mid rise office building. The blocks along NE 167th Avenue are 600' long in both directions from the intersections. The blocks facing the north and south legs of NE 6th Avenue are only 250'to 280' deep.

Table 2-5 shows the accident history for the intersection of NE 167th Street and NE 6th Avenue. During the previous three years there were no fatality accidents with a fatality, but eight people were injured in that crash. Historically there has been an average of 53 crashes per year at this intersection with an average of 48 injuries per year

Table 2-5
Accident History
NE 167th Street and NE 6th Avenue

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	32	65	39	71	0	65
2002	0	0	0	17	30	28	45	0	30
2003	0	0	0	25	49	18	43	0	49
Total	0	0	0	74	144	85	159	0	144

2.5 NE 163rd Street at W. Dixie Highway and Biscayne Boulevard

Figure 2-5 shows the lane configuration around this complicated intersection. NE 163rd Street has three through lanes in each direction and one left turn lane at Dixie and two left turn lanes at Biscayne. W Dixie Highway, SR 909 under State jurisdiction, has two through lanes in each direction plus a left turn lane. Biscayne Boulevard, US 1 under State jurisdiction, is 4 through lanes in each direction plus two left turn lanes. NE 163rd Street has a 100 foot right-of-way west of Biscayne Boulevard and a 150 foot right-of-way east of Biscayne. Two-way AADT volumes at this intersection along NE 163rd Street, SR 826 under State jurisdiction, are in the range of 44,500 vehicles. Traffic on Biscayne Boulevard is higher, with AADT of 54,200 vehicles. The grade separation would also cross West Dixie Highway which only carries about 17,600 AADT. The flyover would facilitate about 116,000 vehicles per day.

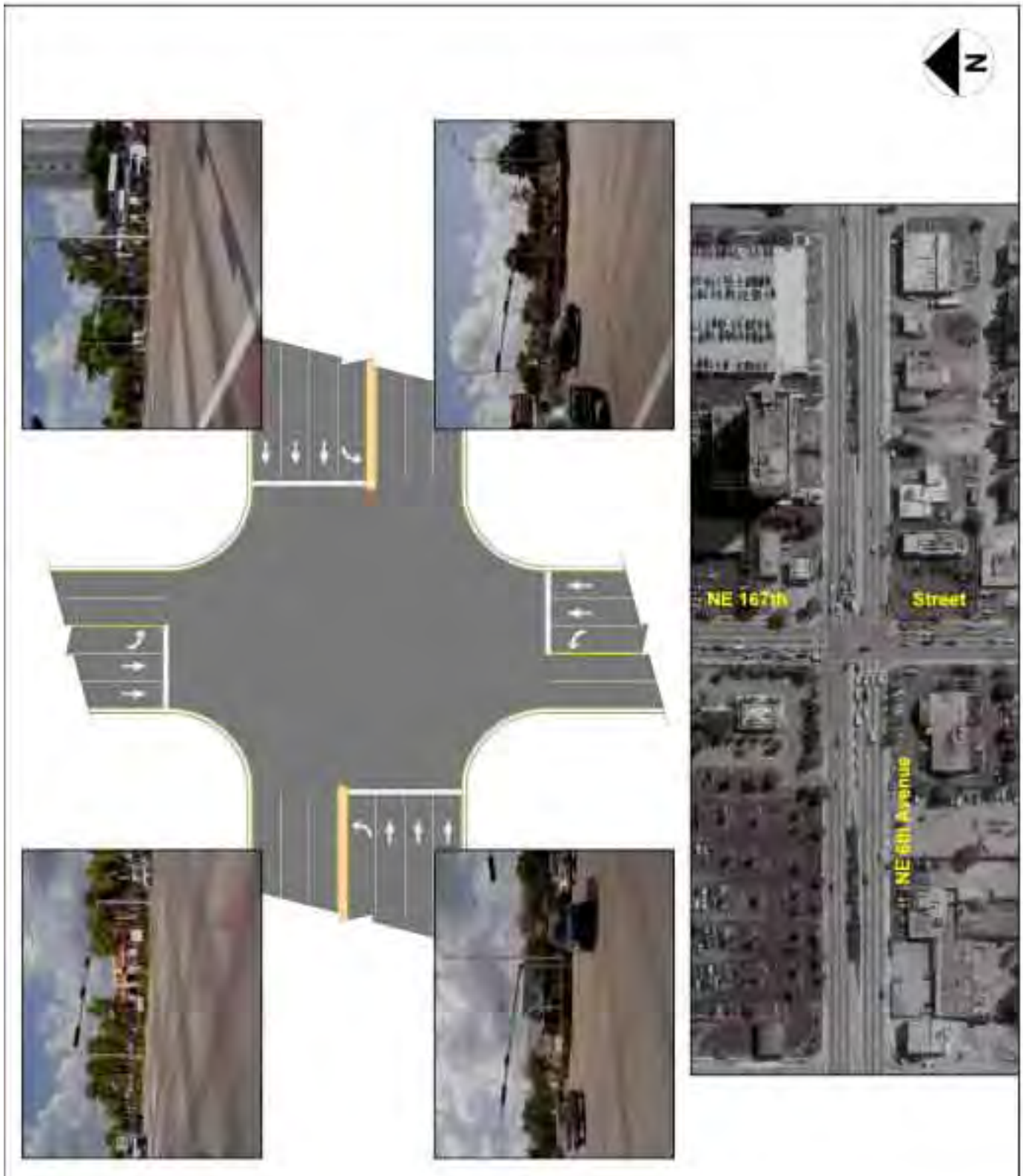


Figure No. 2-4
NE 6th Avenue / NE 167th Street

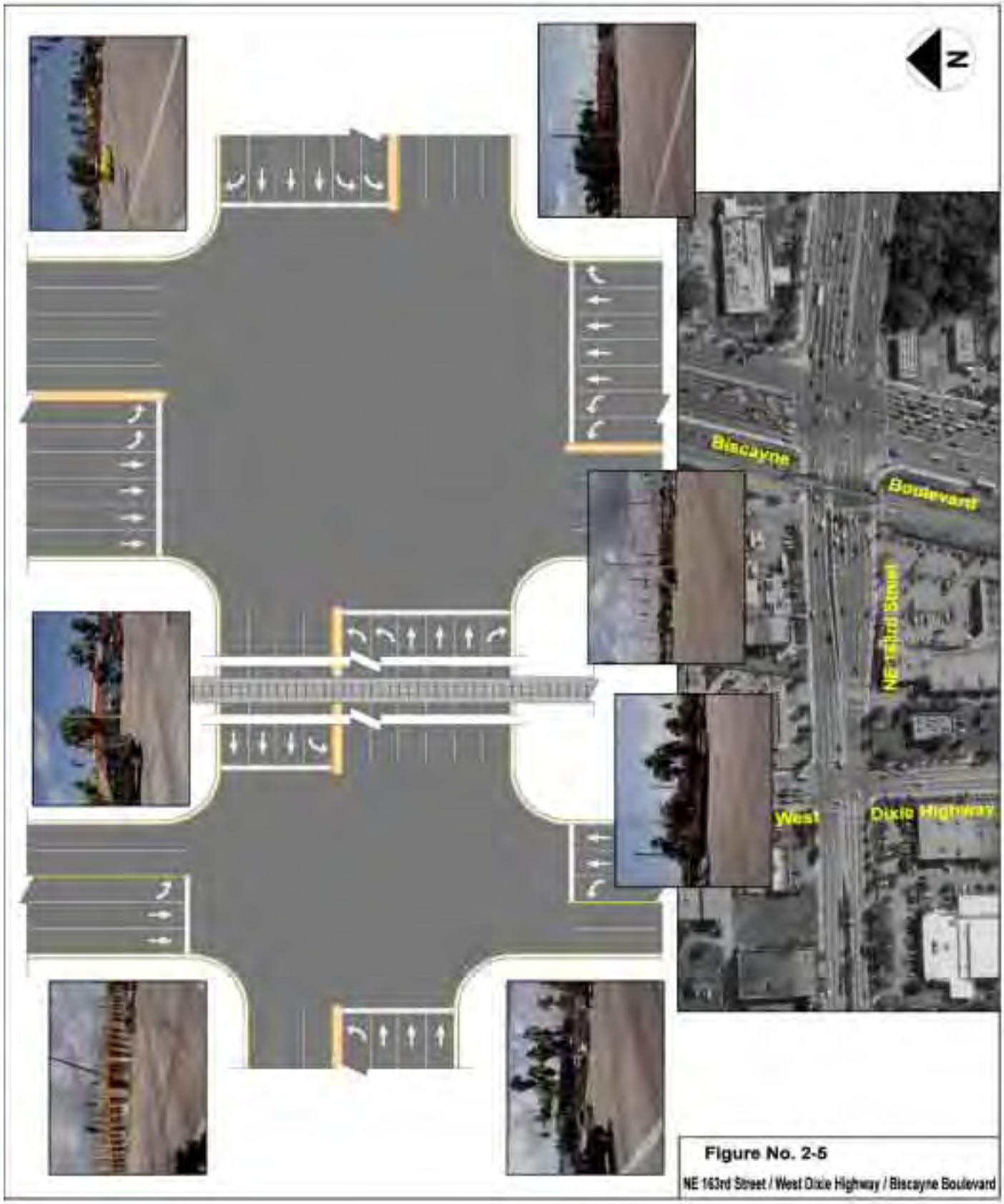


Figure No. 2-5
NE 163rd Street / West Dixie Highway / Biscayne Boulevard

The north leg of Biscayne Boulevard and west leg of Sunny Isles Boulevard both extend well over a thousand feet. The blocks along the southern leg of Biscayne Boulevard are about 400 feet long and the blocks along the western leg of Sunny isles Road are about 600' long. The north east corner of Biscayne and 163rd is the location of a night club backed by wetlands. The southeast corner is a commercial center with a gas station which is also backed by wetlands. Both western corners of Biscayne Boulevard are fronted by the FEC rail line. The next block to the west is West Dixie Highway. Land uses around this intersection is a gas station on the northeast corner, a fast food restaurant on the southeast corner, a car dealer on the southwest corner and two story professional office building on the northwest corner.

Table 2-6 shows the accident history for the intersection of Biscayne Boulevard and NE 163rd Street. During the previous three years there were no fatality accidents. Historically there has been an average of 14 crashes per year at this intersection with an average of 12 injuries per year.

Table 2-6
Accident History
Biscayne Boulevard and NE 163rd Street

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	10	10	10	20	0	10
2002	0	0	0	7	9	6	13	0	9
2003	0	0	0	8	17	2	10	0	17
Total	0	0	0	25	36	18	43	0	36

2.6 SW 107th Avenue at SW 8th Street

As shown in Figure 2-6 SW 8 Street provides three through lanes plus protected left-turn lanes in each direction and SW 107 Avenues has two-lanes in each direction. SW 107th Avenue is State facility – SR 985. SW 8 Street is a State facility, US 41 and it has a 150 foot right-of-way at this intersection. Two-way AADT volumes at this intersection along SW 107th Avenue are in the range of 51,000 vehicles. Traffic on SW 8th Street is at a similar level, with AADT of 54,000 vehicles. The intersection handles about 105,000 vehicles per day.

The north side of SW 8th Street is uninterrupted by driveway cuts because of the canal, however immediately north of the canal is another intersection leading into single family residential areas. The southwest quadrant of the intersection is the FIU campus which creates a super-block. The southeast quadrant of the intersection is a gas station with multiple curb cuts in each direction.

The western leg of SW 8 Street has a bridge crossing the canal 1250' west of the intersection. The first block along the eastern leg of SW 8 Street occurs after about 450' on the south side of the street. Blocks facing SW 107th Avenue are as close as 230'.

Table 2-7 shows the accident history for the intersection of SW 107th Avenue and SW 8th Street. During the previous three years there were no fatality accidents. Historically there has been an average of 40 crashes per year at this intersection with an average of 37 injuries per year.

Figure No. 2-6
SW 8th Street / SW 107Avenue

Table 2-7
Accident History
SW 107th Avenue and SW 8th Street

	Fatal Crash Statistics			Injury Crash Statistics		Property Damage Only	Totals		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	17	32	23	40	0	32
2002	0	0	0	18	37	18	36	0	37
2003	0	0	0	24	43	22	46	0	43
Total	0	0	0	59	112	63	122	0	112

2.7 SW 27th Avenue at South Dixie Highway

South Dixie Highway, a State facility designated US 1 provides three through lanes with protected left-turn lanes. SW 27th Avenue, also a State facility designated SR 9, provides two through lanes in each direction plus the protected left-turn lane. South Dixie Highway has a 150 foot right-of-way. Two-way AADT volumes at this intersection along NW 27th Avenue are in the range of 29,000 vehicles. Traffic volumes on South Dixie Highway are much higher, with AADT of 101,500 vehicles. The intersection handles about 130,500 vehicles per day.

Figure 2-7 shows that both of the northern quadrants of the intersection are occupied by Metrorail right-of-way with almost no curb cuts. The southwest quadrant is occupied by a gas station and the southeast quadrant is occupied by a marine related retail facility. Along the southwest side of US 1 the block is 820' long, but on the southeast side of US 1 the block is about 300' long. The blocks along SW 27th Avenue are only about 200' from the intersection.

Table 2-8 shows the accident history for the intersection of SW 27th Avenue and South Dixie Highway. During the previous three years there were two fatality accidents. Historically there has been an average of 56 crashes per year at this intersection with an average of 29 injuries per year.

Table 2-8
Accident History
SW 27th Avenue and South Dixie Highway

	Fatal Crash Statistics			Injury Crash Statistics		Property Damage Only	Totals		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	1	2	1	19	27	41	61	2	28
2002	0	0	0	16	31	42	58	0	31
2003	0	0	0	21	29	30	51	0	29
Total	1	2	1	56	87	113	170	2	88

Figure No. 2-7
South Dixie Highway / SW 27th Avenue

2.8 SW 87th Avenue at SW 8th Street

Figure 2-8 shows that SW 8 Street, a State road, provides three through lanes plus protected left-turn lanes in each direction and SW 87th Avenue, a county road, has two-lanes in each direction. SW 8 Street has a 150 foot wide right-of-way at this location. Two-way AADT volumes at this intersection along NW 87th Avenue are in the range of 37,500 vehicles. Traffic on SW 8th Street is much higher, with AADT of 58,000 vehicles. The intersection handles about 95,500 vehicles per day.

The north side of SW 8th Street is bounded by a canal which provides significant separation from the single family residential neighborhoods located to the north of the canal. The canal also provides long sections of roadway with no curb cuts. On the south side of the intersections both quadrants contain gas stations (at the time of the site visit the station on the southwest corner was abandoned.) Heading north, south, and east from the intersection it is only 250 to 300 feet to the next intersection. Only in the westerly direction is the block length a reasonable 450'.

Table 2-9 shows the accident history for the intersection of SW 87th Avenue and SW 8th Street. During the previous three years there were no accidents with a fatality. Historically there has been an average of 40 crashes per year at this intersection with an average of 45 injuries per year.

Table 2-9
Accident History
SW 87th Avenue and SW 8th Street

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	29	49	17	46	0	49
2002	0	0	0	21	40	16	37	0	40
2003	0	0	0	20	46	18	38	0	46
Total	0	0	0	70	135	51	121	0	135

2.9 SW 104th Street at South Dixie Highway

South Dixie Highway, a State road, provides three through lanes with two protected left-turn lanes. SW 104th Street, a State facility SR 990, provides two through lanes in each direction plus the protected left-turn lanes. South Dixie Highway has a right-of-way of 100 feet. Two-way AADT volumes at this intersection along SW 104th Street are in the range of 11,100 vehicles. Traffic on South Dixie Highway is much higher, with AADT of 68,000 vehicles. The intersection handles about 79,100 vehicles per day.

The west side of south Dixie Highway is adjacent to the busway and has very long stretches of uninterrupted street. The blocks on the east side of US 1 are about 600 feet long. The blocks along 104th Street are shorter, 250 feet on the west and 400 feet on the east side of the intersection. Both of the east corners of the intersection are occupied by gas stations as shown in the photos on Figure 2-9.

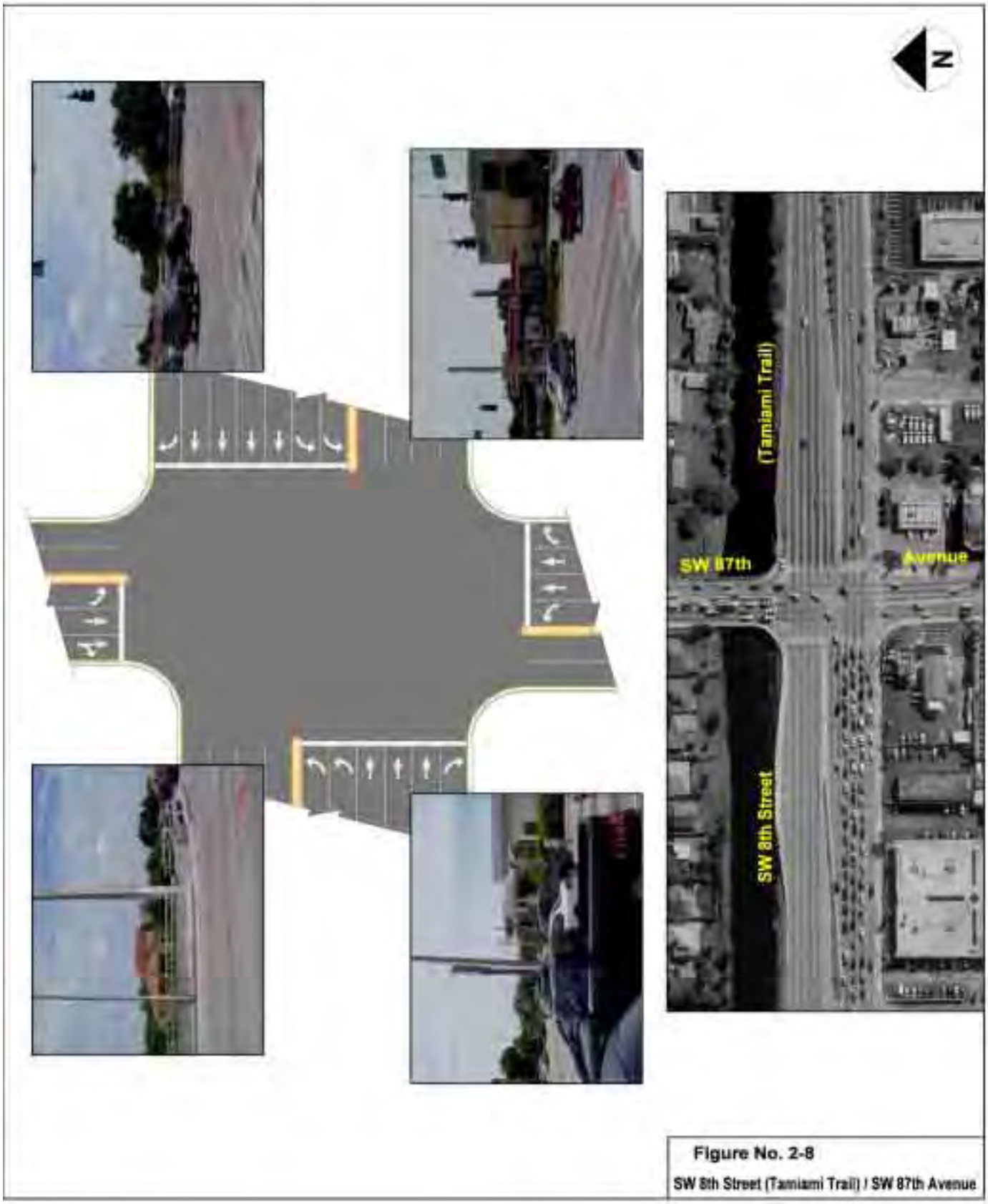


Figure No. 2-8
SW 8th Street (Tamiami Trail) / SW 87th Avenue

Figure No. 2-9
SW 104th Avenue / South Dixie Highway

Table 2-10 shows the accident history for the intersection of SW 104th Street and South Dixie Highway. During the previous three years there were no fatality accidents. Historically there has been an average of 2 crashes per year at this intersection with an average of 1 injury per year.

Table 2-10
Accident History
SW 104th Street and South Dixie Highway

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	2	2	0	2	0	2
2002	0	0	0	0	0	1	1	0	1
2003	0	0	0	1	1	1	2	0	1
Total	0	0	0	3	3	2	5	0	3

2.10 Bird Road at S. Dixie Highway

Bird Road (SW 40th Street) west of US 1 is a State facility SR 976. It has four lanes plus a protected turn lane; east of US 1 Bird Road is 3 lanes plus 1 turn lane. US 1, also a State facility, is 6 through lanes plus 1 turn lane on both sides of the intersection. US 1 has a 100 foot right-of-way at this location. Two-way Average Annual Daily Traffic (AADT) volume on US 1 is about 84,000 and the AADT on Bird Road is 49,500 making this a very busy intersection handling 133,500 vehicle per day.

The photos and the aerial on Figure 2-10 show that the northeast quadrant of this intersection is occupied by the Metrorail right-of-way. The remaining quadrants are all occupied by automobile related uses: a car wash, a gas station, and car rental facility. Along US 1 the northwest side of the street is uninterrupted. The block facing the southeast side of US 1 is only 200'long and the block forming the north east quadrant is 900' long.

Table 2-11 shows the accident history for the intersection of Bird Road and South Dixie Highway. During the previous three years there was only one accident with a fatality. Historically there has been an average of 36 crashes per year at this intersection with an average of 10 injuries per year.

Table 2-11
Accident History
Bird Road and South Dixie Highway

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	8	14	31	39	0	14
2002	0	0	0	6	9	30	36	0	9
2003	1	1	0	8	8	23	32	1	8
Total	1	1	0	22	31	84	107	1	31

Figure No. 2-10

South Dixie Highway / SW 40th Street (Bird Road)

2.11 SW 57th Avenue at South Dixie Highway

The intersection diagram on Figure 2-11 shows that NW 57th Avenue (Red Road) is four lanes wide at this intersection. It is a State facility, SR 968. US 1, a State facility, is 6 through lanes plus 1 protected left turn lane. The right-of-way for US 1 is 100 feet wide at this location. Two-way Average Annual Daily Traffic (AADT) volumes on US 1 are about 89,000. On NW 57th Avenue the AADT is about 22,000. The combined volumes pump about 111,000 vehicles per day through this intersection.

The photographs and the aerial, show that the southeast quadrant of the intersection is occupied by a fast food restaurant and mixed commercial establishments. The southwest quadrant of the intersection is occupied by a major regional shopping center – Sunset Place. Both quadrants of the north side of the intersection are occupied by the Metrorail right-of-way and are uninterrupted by curb cuts. The block forming the southwest quadrant is 1600 feet long and the block forming the southeast quadrant is 700 feet long.

Table 2-12 shows the accident history for the intersection of SW 57th Avenue and South Dixie Highway. During the previous three years there was only one accident with a fatality. Historically there has been an average of 21 crashes per year at this intersection with an average of 16 injuries per year.

Table 2-12
Accident History
SW 57th Avenue and South Dixie Highway

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	12	16	8	20	0	16
2002	1	1	0	10	21	12	23	1	21
2003	0	0	0	5	10	10	21	0	10
Total	1	1	0	27	47	47	64	1	47

2.12 NW 87th Avenue at NW 12th Street

NW 87th Avenue is 6 through lanes and 1 protected left turn lane at this intersection. NW 87th Avenue carries about 59,000 trips per day. NW 12th Street has a three lane exit ramp from SR 836 600 feet east of the intersection. NW 12th Street has two left turn lanes 1 right turn only lane and two through lanes in the west bound direction. In the east bound direction there is one left turn lane, one right turn lane and one through lane. NW 12th Street carries a daily volume of 33,500 vehicles. The intersection handles a total of 92,500 vehicles per day.

The photographs and the aerial in Figure 2-12 show that a restaurant sits on the northeast quadrant of this intersection and that a small commercial establishment sits on the immediate northwest quadrant. Immediately adjacent to both of theses uses is a car lot. The south side of the intersection is entirely SR 836 right-of-way. To the south of the intersection freeway on and

Figure No. 2-11
South Dixie Highway / SW 57th Avenue (Red Road)

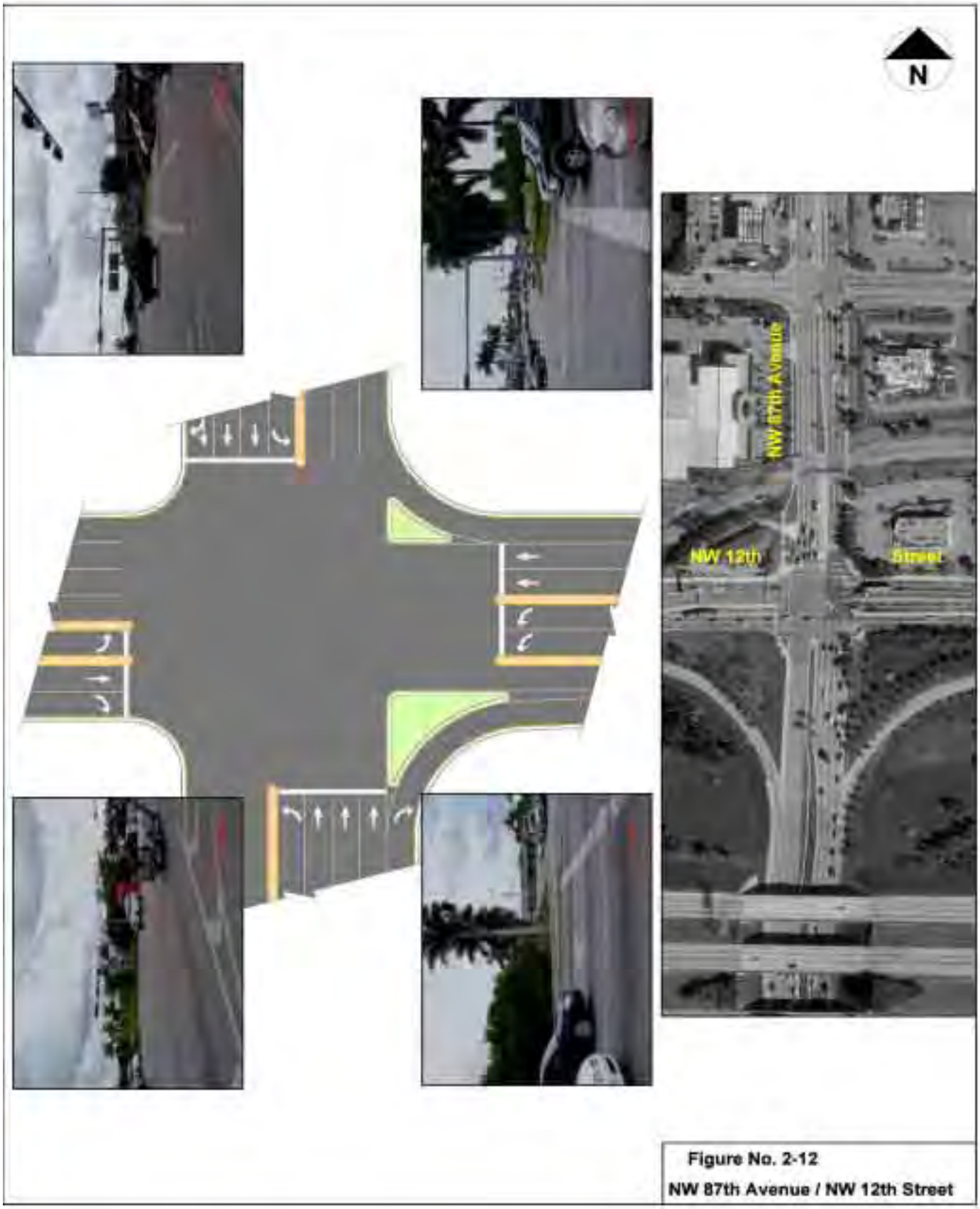


Figure No. 2-12
NW 87th Avenue / NW 12th Street

off ramps are only 300 feet from the intersection. To the east the westbound off ramp is 600 feet from the intersection. To the north CSX railroad tracks are 250 feet from the intersection.

This location is not on State facilities so an accident record was not available.

2.13 US 441 at Ives Dairy Road

US 441 (NE 2nd Avenue) and Ives Dairy Road are both 6-lane facilities with duel left turn lanes and Ives Dairy Road is a 4-lane facility. Both facilities are under State jurisdiction as US 441 and SR 854, respectively. All approaches to this intersection have protected left-turn lanes. Both 441 and Ives Dairy Road have 100 foot rights-of-way. US 441 has an AADT of 65,500 vehicles.

The land uses around this intersection, depicted in Figure 2-13 include a drug store on the southwest corner, mixed commercial center on the northwest corner, a gas station on the northeast corner and a strip commercial center on the southeast corner. Away from the intersection the south side of Ives Dairy is fronted with residential uses.

When considering the location of a grade separation the blocks on the north side of Ives Dairy Road are over 1000 feet long. On the west side of US 441 it is 500 feet to the first intersection, within 1,000 feet there are 3 "T" intersections to the west. To the east of US 441 there is only 1 "T" intersection connecting into Ives Dairy Rd. On the south side of Ives Dairy Road there is an access road that the residential areas tie into that feed out through that one "T". South along 441 there is an access road on the west side of the street that has to access point to 441. On the east side of the street one "T" intersection connects into 441.

Table 2-13 shows the accident history for the intersection of US 441 and Ives Dairy Road. During the previous three years there were no accidents with fatalities. Historically there has been an average of 46 crashes per year at this intersection with an average of 44 injuries per year.

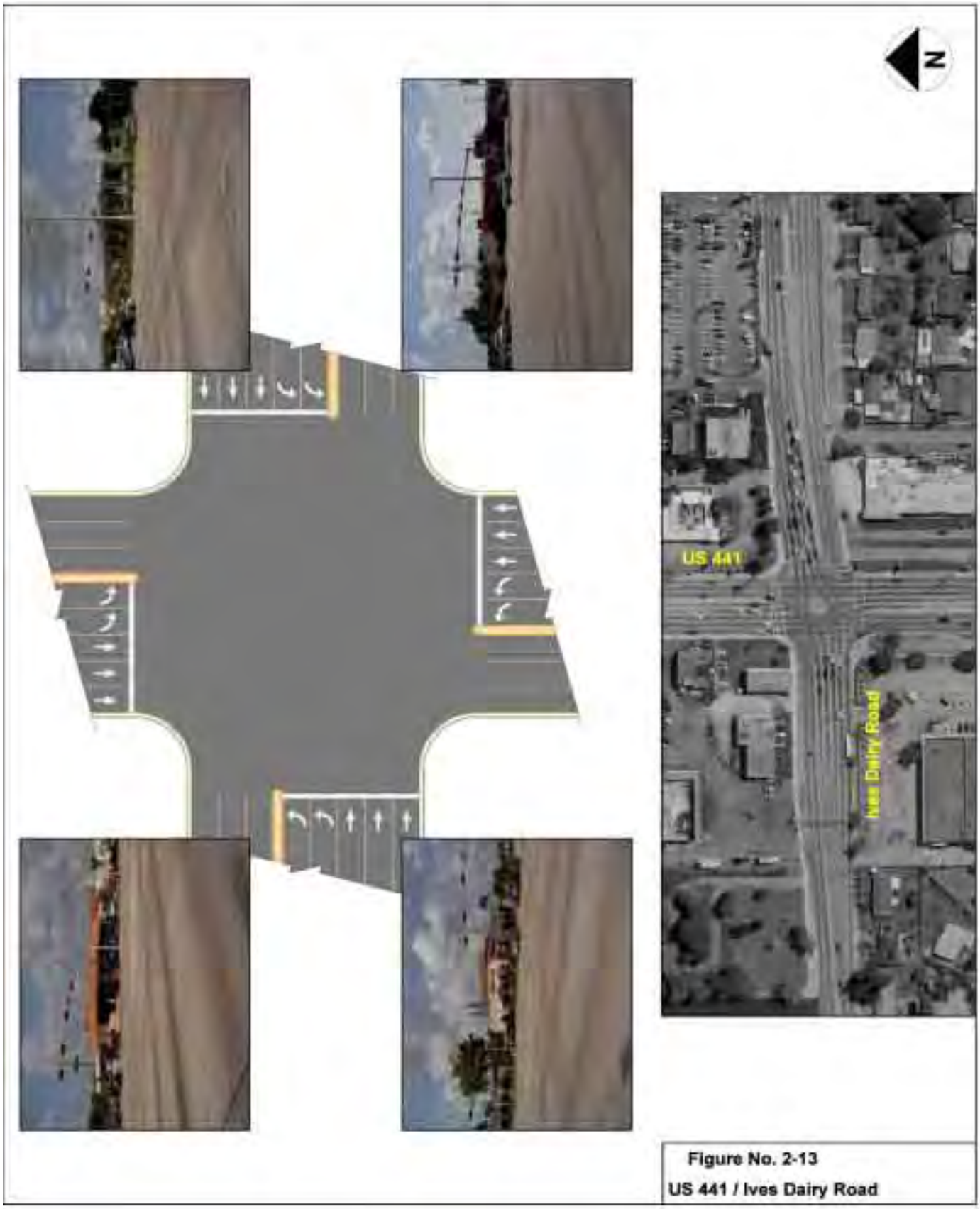


Figure No. 2-13
US 441 / Ives Dairy Road

Table 2-13
Accident History
US 441 and Ives Dairy Road

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	24	54	31	55	0	54
2002	0	0	0	24	29	17	41	0	29
2003	0	0	0	25	48	17	42	0	48
Total	0	0	0	73	131	65	138	0	131

2.14 NW 135th Street at NW 57th Avenue

Figure 2-14 shows that NW 57th Avenue (Red Rd) is a 6-lane facility with protected left turn lanes and NW 135th Street is a 4-lane facility with protected left turn lanes. Both facilities are under State jurisdiction as SR 959 and SR 916, respectively. NW 135th Street has a right-of way width of 100 feet. Red Road handles about 51,000 two-way AADT and NW 135th Street handles about 32,000 two-way AADT. The intersection handles 83,000 vehicles a day.

When considering the location of a grade separation the blocks on the west side of NW 57th Avenue it is over 1000 feet to the nearest intersection. On the southwest quadrant of the intersection there is a road that "T's into NW 135th Street that supplies access to the rear of the industrial district. This intersection is only 70 feet west of the intersection. To the north of the intersection there are no intersections within 1,000 feet of the intersection. To the east there is no intersection within 1,000 feet. South of the intersection the Red Road on and off ramps are located 600 feet from the intersection. The northeast quadrant of the intersection is occupied by Opa-locka Airport. The southern quadrants of the intersection are occupied by Gratigny Right-of-Way and the northwest corner is next to canals running in both directions with a commercial center on the other side of the canals.

Table 2-14 shows the accident history for the intersection of NW 57th Avenue and NW 135th Street. During the previous three years there was only one accident with a fatality, and two people were injured in that crash. Historically there has been an average of 28 crashes per year at this intersection with an average of 28 injuries per year.

Figure No. 2-14
NW 57th Avenue (Red Road) / NW 135th Street

Table 2-14
Accident History
NW 57th Avenue and NW 135th Street

	Fatal Crash Statistics			Injury Crash Statistics		Property Damage Only	Totals		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	14	29	22	36	0	29
2002	1	1	2	18	34	6	25	1	36
2003	0	0	0	8	19	14	22	0	19
Total	0	0	0	40	82	42	83	1	84

2.15 North Kendall Drive at SW 127th Avenue

North Kendall Drive (SW 88th Street) as illustrated in Figure 2-15 is a 6-lane facility at this location and SW 127th Avenue is a 4-lane facility and is a County facility. North Kendall Drive is a State facility, SR 94. All approaches to this intersection have protected duel left-turn lanes (except for north to west turn from SW 127th Avenue.). The right-of-way along Kendall Drive at this location is 150 feet wide. N. Kendall Drive handles about 84,500 two-way AADT and SW 127th Avenue carries 19,000 trips per day. The intersection handles 103,500 vehicles a day.

When considering the location of a grade separation it is over 1,000 feet to the next intersection in the north, west, and east directions. The entire eastern side of the intersection abuts power right-of-way. The southwest corner of the intersection is occupied by a medium sized shopping plaza anchored by Home Depot and the northwest corner is occupied by a large shopping center.

Table 2-15 shows the accident history for the intersection of N. Kendall Drive and SW 127th Avenue. During the previous three years there were no accidents with fatalities. Historically there has been an average of 29 crashes per year at this intersection with an average of 33 injuries per year.

Table 2-15
Accident History
N. Kendall Drive and SW 127th Avenue

	Fatal Crash Statistics			Injury Crash Statistics		Property Damage Only	Totals		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2001	0	0	0	12	20	17	29	0	20
2002	0	0	0	15	30	8	23	0	30
2003	0	0	0	23	48	13	36	0	48
Total	0	0	0	50	98	38	88	0	98

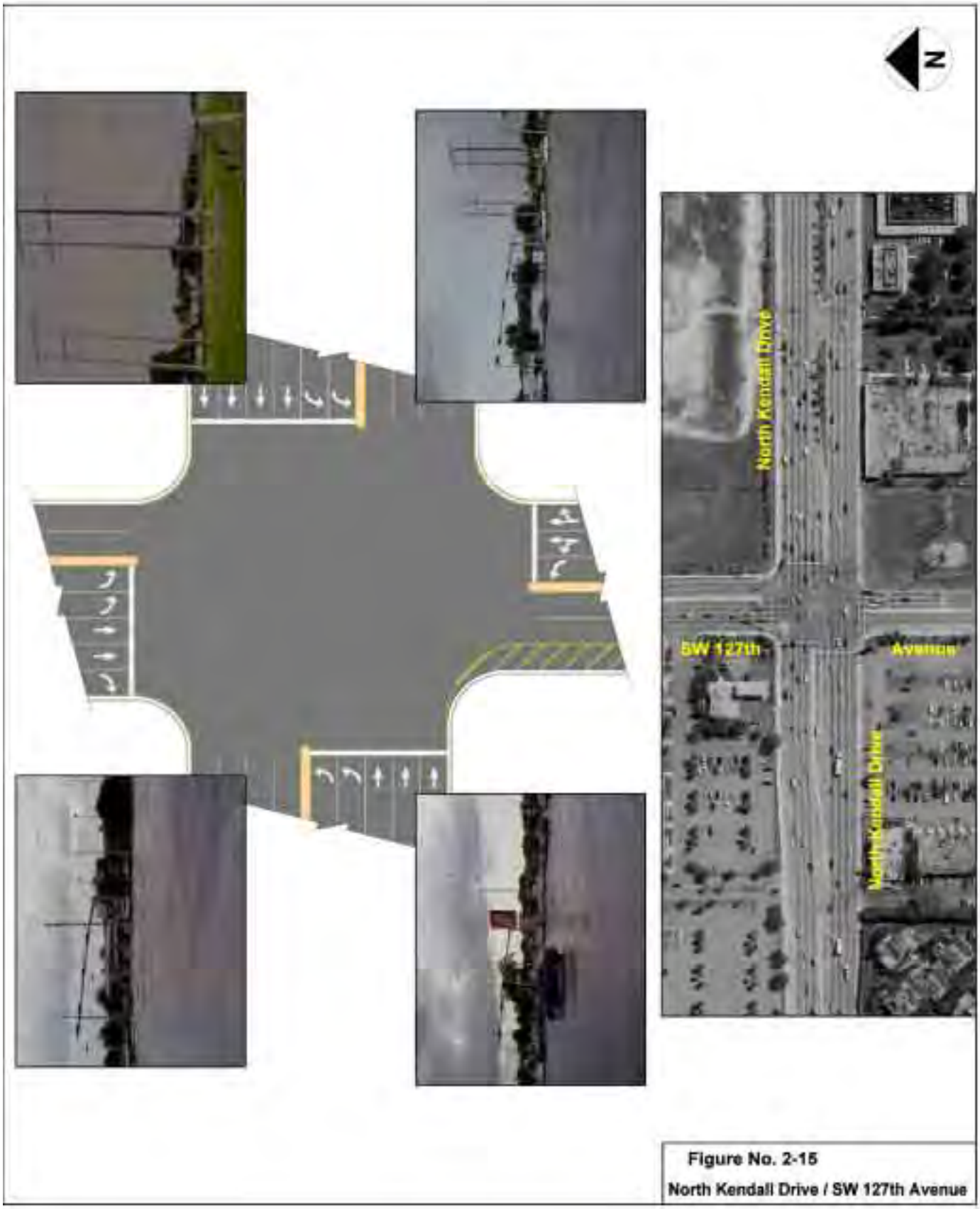


Figure No. 2-15
North Kendall Drive / SW 127th Avenue

2.16 U.S. 1 at SW 136th Street

This intersection diagram in Figure 2-16 shows that all approaches along U.S. 1, both northbound and southbound to this intersection provide three through lanes of traffic. The northbound traffic has two turn lanes that transition to westbound 136th Street. Both directions of Howard Dr. (SW 136th St.), a County facility, have two through lanes, westbound has two turn lanes, while eastbound has three turn lanes to accommodate the northbound movement to U.S. 1. U.S. 1 has 116 foot right-of-way. Two way AADT volumes north of this intersection along U.S. 1 is in the range of 68,000 vehicles, and to the south of the intersection the two way traffic volumes are even greater - 74,000 vehicles. The AADT count on the east side of U.S.1 on 136th St. is 12,500 vehicles.

Figure 2-16 also provides photographs and an aerial photograph of the intersection showing adjacent land use. In the northeast quadrant of the intersection is a home improvement center and two local bank branches. On the southeast corner of the intersection is a retail shopping area. On the northwest corner is a restaurant. On the southwest corner is the Falls shopping center.

This is a unique intersection with a large mall on one corner and an entrance to a large chain home improvements retailer. Compounding to the uniqueness of this intersection is the buslane located on the west side of the intersection paralleling U.S. 1. This intersection will facilitate a grade separation easily because of the busway on the west side parallel to U.S. 1.

Table 2-16 shows the accident history for the intersection of US 1 and SW 136th Street. Accident data was only available for 2002. For the reported year there were no accidents with fatalities. During that year there were only 3 crashes at this intersection with only 2 injuries.

Table 2-16
Accident History
US1@ SW 136th Street

	Fatal Crash Statistics			**Injury Crash Statistics**		**Property Damage Only**	**Totals**		
	Crashes	Fatalities	Injuries	Crashes	Injuries	Crashes	Crashes	Fatalities	Injuries
2002	0	0	0	2	2	1	3	0	2
Total	0	0	0	2	2	1	3	0	2

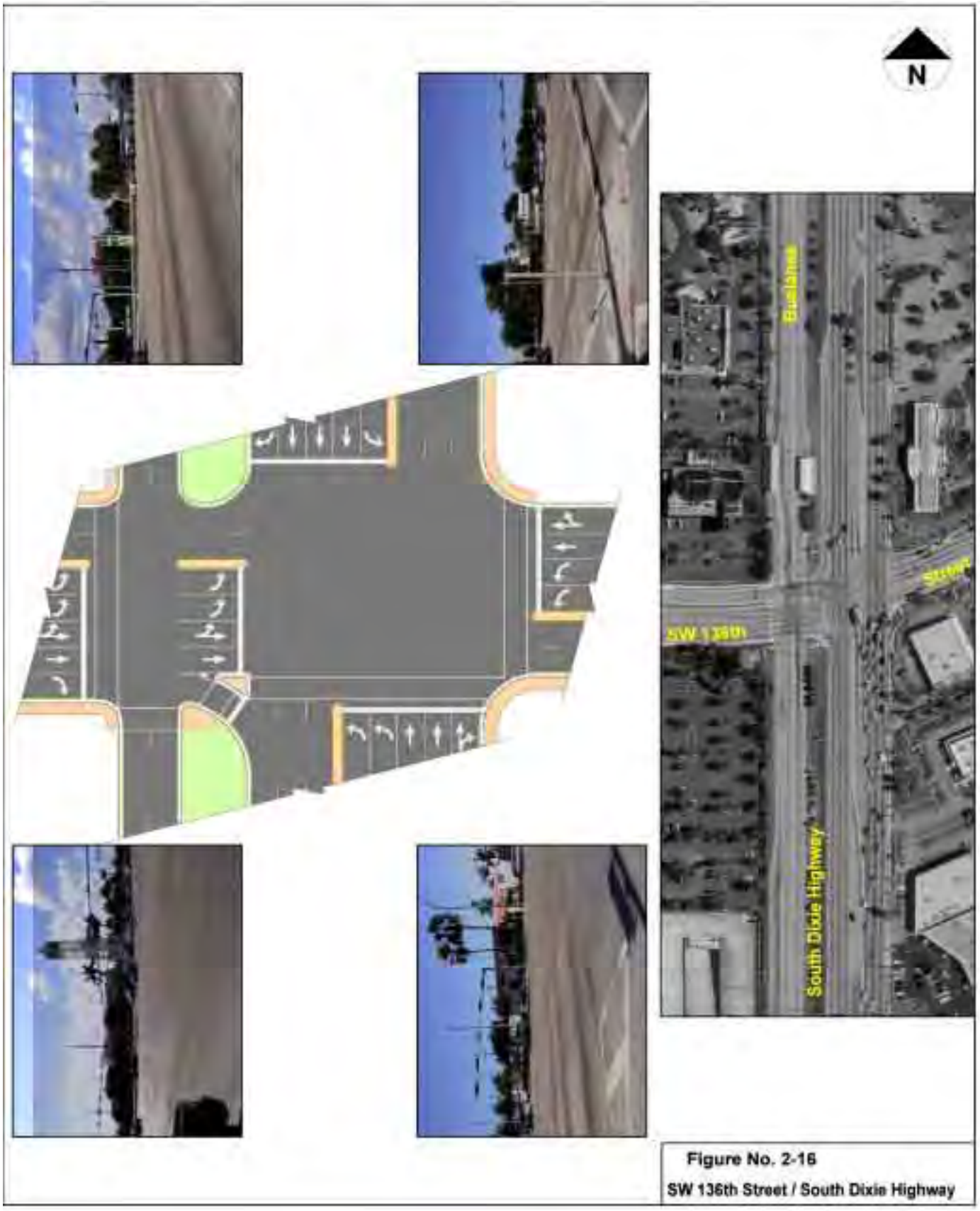


Figure No. 2-16
SW 136th Street / South Dixie Highway

2.17 SW 117th Avenue at SW 152nd Street

Figure 2-17 shows that SW 117th Avenue is a 2-lane facility with individual left and right turn lane and SW 152nd Street is a 6-lane facility with protected left turn lanes. SW 117th Ave handles about 22,556 two-way AADT and SW 152nd Street handles about 41,000 AADT. The intersection handles 63,556 a day. This intersection is 670 feet west of the southbound ramps of the Turnpike. Under the Turnpike SW 152nd St is only two lanes in each direction with a single left turn lane in each direction. The right hand lane is striped out in both directions. Lane continuity between the east side of the Turnpike and west of SW 117 Avenue is a problem. SW 152nd Street is a State route east of the Turnpike, SR 992. SW 117th Avenue and SW 152nd Avenue west of the Turnpike are County facilities.

This area was nominated for consideration for a left turn flyover due to the very long queues that form to turn left from SW 152nd St to the northbound on ramp to the Turnpike. Figure 2-18 illustrates the requirement for that ramp.

To the east of the Turnpike there are residential subdivisions on both the north and south side of the street. The north quadrant between the Turnpike and SW 117th Ave is occupied by SW 117th South Miami-Dade Park n' Ride. The south quadrant between the Turnpike and NW 117th Ave contains a gas station and two drive-through fast food restaurants and MDCPS Maintenance. On the northwest quadrant of the intersection with SW 117th Ave is a car dealership with an entrance that is about 520 feet west of the intersection. The southwest quadrant does not have any intersections within 1000 feet of this intersection. The southwest quadrant is occupied by the US Coast Guard Communication Station and is fenced off.

The accident history for the intersection of SW 117th Ave and SW 152nd Street was collected from Miami-Dade police reports. FDOT records were not available as the intersection is not on the State system.

- In 2002 there were 139 crashes
- In 2003 there were 145 crashes
- In 2004 there were 178 crashes

Over the three year period the number of crashes has increased each year. There were a total of 462 crashes during the three year period and the average number of incidents per year at this intersection is 154 crashes. No fatalities were indicated.

Figure No. 2-17

SW 117th Avenue / SW 152nd Street

3 First Round Evaluation

3.1 Evaluation Criteria

The 17 intersections that were initially identified for potential grade separation projects are to be evaluated through two rounds of increasingly detailed screening criteria. The first round of screening uses six very critical criteria explained in Table 3-1, which shows the Tier I Criteria. The first four evaluation criteria are indicators of need. It is assumed that grade separations reduce the amount of conflicting movements at an intersection and thus, a high level of accidents would be an indicator of the need for a grade separation. The second and third criterion relate to traffic volumes. The total traffic volume through an intersection is an indication of the amount of green time needed to accommodate all of the movements. The higher the total number of vehicles going through an intersection, the less likely the intersection is going to be able to provide a reasonable level of service. When the main road traffic volume is significantly higher than the cross street volume, this is an indicator of which street needs the continuous flow lanes.

Grade separations are a minimum of 22 feet tall and over 2100 feet long (1000 feet on each side of the main intersection). They will have an impact on the local neighborhood. In almost every case, minor cross streets will be affected by the structure constructed to support the bridge. Left turns and cross movements will not be possible for at least 1000 feet on each side of the primary intersection. U-turns can be accommodated at grade under the grade separation.

Table 3-1
Tier I Evaluation Criteria

Criteria	Methodology
Average number of crashes and injuries	A three year history (2001, 2002, 2003) of accidents for each intersection was obtained from FDOT. The number of total accidents and total injuries over the course of the three years was averaged to provide the information used in the summary. The five intersections with the highest number of accidents are highlighted in Table 3-2.
Total Traffic Volume	24 hour traffic counts (AADT) were collected from FDOT's 2003 database for both streets creating the intersection. The total of both volumes is presented to indicate the magnitude of the traffic passing through each intersection. The five intersections with the highest combined volumes are shown in Table 3-2.
Main Road Traffic Volume	24 hour traffic counts (AADT) were collected from FDOT's 2003 database. The volume presented is for the street with the highest volume. The five highest volumes are presented in the Table 3-2.
ROW	Right-of-Way measures were lifted from subdivision plans. The five widest rights-of-way are highlighted in the Table 3-2.
Impact on Local Streets	Field observations were conducted to determine the number of streets on either side of the intersections that would be impacted by the construction of a grade separation using a 1000 foot approach. The

	numbers indicate the total number of streets that would be impacted. An impact is a prohibition of left turns and straight across movements. The five potential grade separations affecting the least amount of local circulation are highlighted in Table 3-2.
Land Use Impacts	Field observations were conducted to determine the type of land uses that surrounded each intersection. The prototypical grade separation will allow full same side access to properties (i.e. eastbound traffic can access all driveways on the south side of the street) and opposing direction traffic will be able to access parcels by U-turns in the intersection with minimal backtracking. However, there is a quadrant on each side of the street that is not easily accessible by traffic in the opposing direction. Table 3-2 summarizes the land uses that would be impacted and the five potential projects with the least impact are highlighted below.

3.2 Evaluation

Table 3-2 summarizes the information collected for each of the Tier I intersections. The five intersections in each category that received the "best" rating (as described in Table 3-1) are shown in green. A red quadrant indicates a "fatal flaw." The intersections that are recommended for further evaluation are shown in gold.

Table 3-2
Tier I Evaluation

Intersection	Average Crashes/ Injuries	Total Traffic Volume	Main Road Traffic Volume	Main Road ROW	Impact on Local Streets	Land Use Impacts
SW 42nd Ave @ 8th St.	25 / 10	96,500	50,000 (LeJeune)	100 ft.	Affects 6 cross streets	Car dealer at NW corner and gas station on SW corner need access from 42.
NW 42nd Ave. @ Flagler St.	34 / 24	94,000	53,500 (Flagler)	100 ft. (LeJeune)	Affects 1 cross street + 4 "T"	Fast food at NE corner and office on SW corner need access from 42nd Ave.
Milam Dairy Rd. @ NW 36th St.	36 / 18	94,500	62,500 (36th St)	150 ft.	No Impact	Gas on SW corner loses access to WB traffic
NE 167th St @	53 / 48	76,900	56,500	100 ft	Affects 2	Mixed

NE 6th Ave.			(NE 167)		cross streets + 1 "T"	commercial area on SW and gas station on NE corner lose partial access
Biscayne Blvd @ NE 163rd St	14 / 12	98,700	54,200 (NE 163)	150 ft.	Affects 1 cross street	Strong local opposition to project.
SW 107th Ave. @ SW 8th St.	40 / 37	105,000	54,000 (SW 8)	150 ft.	Affects 1 "T" intersection	None
SW 27th Ave. @ S Dixie Highway	56 / 29	130,000	101,500 (US 1)	100 ft.	Affects 2 "T" intersections	Gas station on SW corner loses partial access
SW 87th Ave @ SW 8th St	40 / 45	95,500	58,000 (SW 8)	150 ft.	Affects 2 "T" intersections	Abandoned gas station loses WB access
SW 104th Street @ S. Dixie Highway	2 / 1	82,700	68,000 (US 1)	100 ft.	Affects 2 "T" intersections	Gas station on NE corner loses access to east bound traffic
SW Bird Rd. @ S. Dixie Highway	36 / 10	133,500	84,000 (US 1)	100 ft.	Affects 6 "T" intersections	Retail store and post office lose partial access.
SW 57th Ave. @ S. Dixie Highway	21 / 16	111,000	89,000 (US 1)	100 ft.	Affects 2 "T" intersections and 1 cross	SB traffic looses all access to Sunset Place
NW 87th Ave. @ NW 12th St.					Conflicts with SR 835 ramps and overpass.	
N Kendall Dr. @ SW 127th Ave.	29/33	103,500	84,500	150 ft.	None	Home Depot center looses access to WB traffic.
441 @ Ives Dairy Road	46/44		65,500	100 ft. (Both)	Affect 3 "T" intersections.	Drug store on SW corner and Gas Station on NE corner lose partial access.
Red Road @ NW 135th St.	28/28	83,000	51,000	100 ft. (Red Rd)	Impact 1 "T" intersection	No Impacts
US 1 @ SW 136th Street	3/2	86,500	74,000	116 ft. (US1)		
SW 152nd Ave @ SW 117th St.	145	63,556	41,000	130 ft at Turnpike.	Need flyover over turnpike and 117 Ave	

3.2.1 SW 42nd Avenue and SW 8th Street

SW 42nd Avenue and SW 8th Street carry roughly equal volumes of traffic, but from a right-of-way standpoint LeJeune provides more right-of-way to support a grade separation. Therefore, if this intersection were to be selected for a project, the grade separation would need to be located along LeJeune. This intersection did not rank in the top five in any category. Construction of a grade separation would block 6 cross streets, turning each corner into a right-in, right-out only T-intersections. This would negatively impact local neighborhood circulation. **This location is not recommended for further study at this time.**

3.2.2 W 42nd Avenue and Flagler Street

Although not in the top five intersections, the W 42nd Avenue/Flagler intersection had a very high accident rate. Although Flagler Street carries a larger volume of traffic than W 42 Avenue, the Flagler Street right-of-way is too narrow to accommodate a grade-separation structure. Therefore, the grade separation structure must be on W 42 Avenue. As in most of the older sections of Miami, the construction of a grade separation along W 42 Avenue would impact the ability to make left turns in and out of the neighborhoods. The grade separation would impact one cross street and four "T" intersections. Access to the gas station on the southeast corner of the intersection would be most affected by the construction of a grade separation. **This intersection is not recommended for further study at this time.**

3.2.3 NW 72nd Avenue and NW 36th Street

This intersection is rated in the top five in three of the six evaluation categories. The intersection has very high traffic volumes and a high accident rate. The pavement width is more than adequate on NW 36th Street to accommodate a grade separation. The intersection is surrounded by big blocks so there would be no impacts to local circulation. The land use impacts are minimal because of the location of the County Jail and the Miami-Dade Public Works garage on the east side of the intersection. **This intersection is recommended for further analysis for a grade separation on NW 36th Street.**

3.2.4 NE 6th Avenue and NE 167th Street

This intersection has a very high accident rate, but none of the other categories ranks particularly high. The pavement width of NE 167th Street is not wide enough to accommodate the grade separation with major widening. The neighborhood traffic impacts and the land use impacts are not particularly severe. **Although this intersection could support a grade separation, it is not as high a priority as other intersections.**

3.2.5 Biscayne Boulevard and NE 163rd Street

A fly-over on NE 163rd Street would provide not only the grade separation of Biscayne Boulevard, but also the FEC railroad and Dixie Highway, providing tremendous relief to the area. The long blocks cause minimal impact. This intersection ranks in this top five in three of

the 6 evaluation categories and merits further study. The grade separation will be higher than all of the other grade separation because the clearance over a railroad is higher (24 feet as opposed to 16.5 feet). It will also be much more expensive because it will have three bridges rather than one. An earlier FDOT project grade separation was not supported by the local community or the City. **The City of Aventura has requested that the project be removed from further consideration.**

3.2.6 SW 107th Avenue and SW 8th Street

This intersection rates in the top five of five of the six evaluation criteria. There are a high number of accidents, high total traffic volume through the intersection, plenty of right-of-way to construct the grade separation and minimal impact on local businesses and local circulation. **This intersection is recommended for further analysis for a grade separation on SW 8th Street.**

3.2.7 SW 27th Avenue and S. Dixie Highway

No grade separation can be constructed on SW 27th Avenue because the Metrorail Structure would interfere with the grade separation structure, therefore, any grade separation at this location must be constructed along S. Dixie Highway. This intersection rates in the top five in four of the six evaluation criteria categories. The accident rate at this intersection is the highest of all the intersections evaluated, the through volume on US 1 is the highest of all the intersections evaluated, the total volume through the intersection is large, and there is minimal impact to local circulation. US 1 is not as wide as some of the other intersections, so it will not be as easy to construct a grade separation as other locations. **This intersection is recommended for further analysis for a grade separation on South Dixie Highway.**

3.2.8 SW 87th Avenue and SW 8th Street

This intersection raked in the top five intersections in four of the six categories, which indicates that it should be studied further. This intersection has a very high accident rate. The right-of–way along SW 8th Street is 150 feet wide and is sufficiently wide enough to construct the grade separation. It would also be easy to implement because there are minimal impacts on local streets and local businesses. **This intersection is recommended for further analysis for a grade separation on SW 8th Street**

3.2.9 SW 104th Street and S. Dixie Highway

This intersection is similar to every major intersection along US 1. It has a high main arterial traffic volume and has limited through streets and left turn opportunities. The intersection rates high in both of these evaluation categories, but it does not rate very high in any other category. This intersection has a minimal right-of-way width and could accommodate a grade separation, but there are other intersections in the County that should be pursued prior to this intersection. **This intersection is not recommended for further study at this time.**

3.2.10 Bird Road and S. Dixie Highway

No grade separation can be constructed on Bird Road because the Metrorail Structure would interfere with the grade separation structure, therefore, any grade separation at this location must be constructed along S. Dixie Highway. This intersection has a high accident rate, but it is not one of the top five intersections in this category. Of all the locations evaluated, this intersection has the highest volume of traffic moving through it. There are at least 6 "T" intersections that would be impacted by construction of a grade separation, which is one of the worst local street impacts of all of the locations considered. Finally, construction of a grade separation at this intersection would impact access to two facilities making it more difficult to implement. **This intersection, while it could easily accommodate a grade separation, is not recommended for further analysis in this study.**

3.2.11 SW 57th Avenue and S. Dixie Highway

No grade separation can be constructed on SW 57th Avenue because the Metrorail Structure would interfere with the grade separation structure, therefore any grade separation at this location must be constructed along S. Dixie Highway. This intersection rates in the top five in three of the six evaluation criteria. There is a very high total volume of traffic using the intersection. There is a high volume of through traffic on the main arterial, but a signalized intersection would be cut off by the grade separation. All of the parking for a major shopping center is located in the southeast quadrant of the intersection so it would not be accessible at all for southbound traffic**. Because of impacts to the shopping center this intersection should not be studied further.**

3.2.12 NW 87th Avenue and NW 12th Street

No grade separation can be located on the NW 12th Street because the necessary structure extends 1,000 feet from the intersection and would block the exiting traffic from SR 836, thus requiring its relocation. Additionally, the SR 836 off ramp is only 600 feet east of the intersection. No grade separation can be built on NW 87th Avenue because the structure would extend well beyond the SR 836 overpass. **This intersection is dropped from any further evaluation.**

3.2.13 US 441 and Ives Dairy Road

This intersection rates in the top five of only one category of the six evaluation criteria – accident rates. For the relatively low volume intersection there is a high rate of accidents. Both, U.S. 441 and Ives Dairy Road only have a hundred foot right-of-way. The intersection has an access road along the east side of 441 south of Ives Dairy Road and another access road on the south side of Ives Dairy Road east of 441. These access roads would make it easier to implement a grade-separation at this location. **This intersection is not recommended for further study at this time because there are other intersections that should be a higher priority at this time.**

3.2.14 NW 135th Street and NW 57th Avenue

No grade separation can be built on NW 57th Avenue because the grade separation structure would extend well into the Gratigny Overpass. Any considered grade separation must be on NW 135th Street. It would be very easy to build a grade separation along NW 135th Street because of the lack of impacts on local surface street and impacts on adjacent properties. However, this intersection did not rate high in the need for the grade separation. **This intersection is not recommended for further study at this time.**

3.2.15 N. Kendall Drive and SW 127th Avenue

The height of the high power lines adjacent to SW 127th Avenue will need to be verified to make sure that adequate clearance is still available if a grade separation is constructed on N. Kendall Drive. This intersection rated in the top five of four out of the six categories: total traffic in the intersection, traffic on the major arterial, right-of-way width and ease of construction. There are no impacts to local circulation. **This intersection is recommended for further study with a grade separation along Kendall Drive.**

3.2.16 US 1 @ SW 136th Avenue/South Dade Busway

This intersection is not rated highly in any category. Although only one year of accident data was available, it had a very low accident rate. Traffic volumes are high, but not in the category of the other recommended locations. **Although there were minimal local impacts from a grade separation, this intersection is not recommended for further study.**

3.2.17 Turnpike NB on ramp @ SW 152nd Ave

This intersection has the highest average accidents of any intersection in the study but it did not rate high in any other category. The grade separation would need to fly-over the turnpike. The height of the separation would require that the structure extend west of the SW 117th Avenue. The cost of a flyover over the Turnpike may not be justified by the current volumes. However the signal timing at this location is on a 90 second cycle with only 15 seconds set aside for left turns. It is strongly recommended that the signal timing be revaluated. Secondly there are two through lanes and one left turn lane. The right hand lane, which is 12.5 feet wide is striped out. A second left turn lane and new signal timing should greatly improve operations at this location. **A detailed traffic study leading to signal retiming and lane reconfiguration is highly recommended.**

4 TIER II ALTERNATIVES

4.1 INTRODUCTION

In the previous chapter, five intersections were recommended for further evaluation for a grade separation because they rated the highest in 6 evaluation criteria categories. The intersections that were recommended are as follows:

- SW 107th Avenue and SW 8th Street with the grade separation on SW 8th Street.
- SW 87th Avenue and SW 8th Street with the grade separation on SW 8th Street.
- SW 27th Avenue and South Dixie Highway with the grade separation on South Dixie Highway
- North Kendall Drive and SW 127th Avenue with the grade separation on North Kendall Drive.
- NW 36th Street and NW 72nd Avenue with the grade separation on NW 36th Street.

Phase II assessment looks at the impact the grade separation would make on property access, traffic signal timing and bus routes.

4.2 SW 107th Avenue and SW 8th Street

Figure 4-1 shows that to the west of the intersection of SW 107th Avenue and SW 8th Street the implementation of a grade separation would have no impact on local circulation. As discussed earlier in the report, a grade separation structure would extend 1000 feet on either side of an intersection and could impact local streets. There are no local streets intersecting SW 8th Street within 1,000 feet of the intersection. To the east of the intersection there are no streets intersecting SW 8th Street from the north because of the canal, however, on the south side of the street, SW 105th Avenue intersects SW 8th Street 900 feet to the east. A reconstruction of this location could probably provide a smooth transition and prevent any impact on traffic entering or exiting SW 105th Avenue.

The construction of a grade separation at the intersection of SW 107th Avenue and SW 8th Street would have no impact on access to property in three of the four quadrants of the intersection. Both the northeast and northwest quadrants are bounded by a canal and there are no driveways or curb cuts on the north side of SW 8th Street. The Florida International University (FIU) campus lies to the southwest of the intersection and there are no driveways or curb cuts within 1000 feet to the west of the intersection being considered for this project. To the southeast, there are two properties that would be impacted by this project. There are four driveways within the first 450 feet east of SW 107th Avenue. The first two driveways provide access to a gas station on the corner. The next two driveways provide access to a shopping plaza. There is an opening in the concrete median along SW 8th Street in front of that fourth driveway that allows for left

Area Impacted By Structure (West Approach)

Area Impacted By Structure (East Approach)

Figure No. 4-1

SW 8th Street / SW 107th Avenue

turns into and out of the shopping plaza. The other three driveways are restricted to right turns only because of the median barrier. A third property does not access directly onto SW 8th Street and that is a multifamily development just east of the shopping plaza. It exits onto SW 105th Street. All of the properties in this quadrant would maintain access to east bound traffic, as it is currently laid out. West bound traffic would access all of the properties in this quadrant via a U-turn at SW 107th Avenue.

Visually, the structure will block the views of the commercial facilities on the south side of the street from west bound traffic. The businesses above will all claim business damages from lack of visibility. The walled multi-family residential community does not face SW 8th Street and the structure would be lower than the wall in the vicinity of these units. So, it should have no visual impact on the community.

The traffic signal at this intersection is on a two minute cycle. Traffic on SW 8th Street experiences 1 minute and fifteen seconds of red time. The left turn cycle is 10 seconds and through traffic receives 35 seconds of green time. The grade separation of the through traffic would provide continuous flow to through traffic and would provide an extra 35 seconds to left turn movements and to traffic on SW 107th Avenue. Elimination of the red time to allow movement on SW 107th Avenue would eliminate 37.5 minutes of red time for 2,400 peak hour/peak direction vehicles operating as through traffic on SW 8th Street.

The grade separation at this location would impact three routes, the 8, 11 and 71. The 8 has 4 buses per hour (two in each direction) turning between SW 107th Avenue, south of SW 8th Street and Tamiami Trail and east of SW 107th Avenue. Route 11 has 6 buses per hour and Route 71 has 8 buses per hour operating in a north-south direction on SW 107th Avenue. Thus, the grade separation would impact bus operations by providing 35 seconds more green time to SW 107th Avenue. Thus, 18 buses would be impacted by the additional 35 seconds of green time given to north-south traffic at this intersection.

4.3 SW 87th Avenue and SW 8th Street

Figure 4-2 shows that the implementation of a grade separation along SW 8th Street (Tamiami Trail) would have minimal negative impacts on the neighborhood. To the east of the SW 87th Avenue, the grade separation would run in front of SW 86th Court. There is currently a concrete median at 86th Court, which prevents left turns into and out of this street. A grade separation structure would not change the traffic circulation at this location. To the west of SW 87th Avenue, the structure would block left turns into and out of SW 88th Avenue. There is, currently, a break in the concrete median that allows left turns at this location. SW 88th Avenue has access to SW 87th Avenue and westbound traffic on SW 8th Street would need to use SW 87th Avenue to access SW 88th Avenue.

Access to property would, likewise, be minimally disrupted. Parallel to the north side of SW 8th Street runs a canal. There are no driveways along the north side of the street to be impacted by the grade separation structure. On the south side of SW 8th Street, to the east of SW 87th Avenue, lie two gas stations, an auto sales lot and a sizable retail plaza that have six driveways along SW 8th Street. Five of the driveways are right turn only

Area Impacted By Structure (West Approach)

Area Impacted By Structure (East Approach)

Figure No. 4-2

SW 8th Street / SW 87th Avenue

because of the concrete median. There is an opening in the concrete median that allows left turns into the retail plaza. That left turn will no longer be possible but a U-turn under the grade separation at SW 8th Street will still maintain full access to the shopping plaza.

To the west of SW 87th Avenue there are five driveways accessing a gas station, a tire store and mixed retail/warehouse facility. The concrete median along SW 8th Street prevents left turns in and out of all these driveways. So, the construction of a structure would not change the property access in this area.

Visually, the structure will block the views of retail facilities on the south side of the south west bound traffic. The businesses above will all claim business damages from lack of visibility.

The major positive impact will be the traffic flow in this vicinity. The traffic signal is on a 120 second cycle. Traffic on SW 87th Avenue gets one minute of green time and traffic on SW 8th Street gets one minute of green time. The through traffic on SW 8th Street gets 45 seconds of green time. If the through traffic on SW 8th Street were separated from the signal operation, all of the other movements in the intersection would gain 37% more green time and theoretically the intersection capacity could increase by that much. The capacity for the grade separated movement would be more than doubled. Elimination of the red cycle allowing traffic flow on SW 87th Avenue will provide 30 minutes more flow time per hour for the 2,600 peak hour/peak direction vehicles operating as through traffic on SW 8th Street.

The grade separation at Tamiami Trail and SW 87th Avenue will impact two bus routes. The Route 8 operates through the intersection with 12 buses per hour. Depending upon the placement of the bus stop in relation to the grade separation, the 12 buses can either take advantage of the constant through movement if it is routed on the grade separation. If the bus stop on Tamiami remains close to the intersection, then the bus would continue to use the same route as local traffic goes through the signal at 87th Avenue not gaining any benefit. Route 87, which operates 4 buses per hour, north-south through the intersection, would benefit from the 37% additional green time. Because of the need for transfers between these two routes it would be difficult to move the bus stop on Tamiami Trail over 1,000 feet from the intersection. Buses on this intersection would gain very little from the grade separation.

4.4 SW 27th Avenue and South Dixie Highway

As can be seen in Figure 4-3 the implementation of a grade separation along South Dixie Highway (US 1) at SW 27th Avenue would have minimal impact on neighborhood circulation. Because of the Metrorail right-of-way on the north side of US 1, there are no streets from the north intersecting US 1 that would be impacted by the implementation of a grade separation. 800 feet west of SW 27th Avenue lies a roadway that comes into US 1 at a diagonal. The intersection formed is a "Y" and the portion of the "Y" nearest SW 27th Avenue only allows right turns. The western portion of the "Y" is more than 1000 feet from the intersection. This is the portion of the intersection that allows left turns into

Area Impacted By Structure (West Approach)

Area Impacted By Structure (East Approach)

SW 27th Avenue / South Dixie Highway

Figure No. 4-3

the street. This portion of the intersection would not be affected by the grade separation.

To the east of SW 27th Avenue there are two local streets within the area impacted by a potential grade separation. The first "T" intersection is only 300 feet east of SW 27th Avenue. It is one way north bound and is signed right turn only on to US 1. The concrete median on US 1 is open at this point to allow left turns from US 1 into this street. 700 feet east of the SW 27th Avenue lies a local street that ties into US 1 at a diagonal. The intersection only allows right turn in and right turn out of the street. The concrete median along US 1 crosses this intersection. If a grade separation were to be built west bound, traffic on US 1 would still be able to access this street by performing a U-turn under the grade separation. No access to local streets would be lost due the construction of a grade separation at this intersection.

West of SW 27th Avenue, there is a 1000 foot concrete median down the center of US 1. There are no businesses on the north side of US 1 in this area because of Metrorail. Along the south side of US 1 there is a gas station, a fast food restaurant, a large retail strip mall and a seven-story office building. All of these facilities are accessed by only two driveways. Because of the concrete median, only right-turn and left turn movements are allowed into and out of these driveways. The implementation of a grade separation would have no impacts on access to businesses west of SW 27th Avenue.

Immediately east of SW 27th Avenue in the first block is a large marine retail store and accompanying retail plaza. This facility has no driveways directly onto US 1. East of the street is a block that was formerly all residential with driveways onto US 1. In 300 feet, there are four driveways serving four houses that have mostly been converted to commercial facilities. The concrete median on US 1, adjacent to these four driveways, prevent left turns in to, or out of them. The construction of the grade separation would not affect this block. The third block east of SW 27th Avenue contains low rise offices. Access to these buildings is more than 1000 feet east of the intersection and would therefore not be affected by the potential project.

Visually, the structure will block the views of the commercial facilities on the south side of the street from west bound traffic. The businesses above will all claim business damages from lack of visibility.

The traffic signal at this intersection is on a two minute cycle. Traffic on SW 27th Avenue receives 40 seconds of green time. US 1 traffic gets 1 minute and 20 seconds of green time – left turns receive only 10 seconds of green time and the remaining 70 seconds goes to accommodate through traffic on US 1. Separating the through movement on US 1 provides that additional time to through movements on SW 27th Avenue and to the turning movements. The grade separation would add 20 minutes per hour of additional flow to the 4,600 peak hour/peak direction vehicles operating as through traffic on US 1.

There are no bus routes operating on US 1 in this location to benefit from the continuous through operation of the grade separation. The grade separation would, however, benefit the 4 buses per hour operated on Route 22 and the 8 buses per hour operated on the Coconut Grove Circulator. Twelve buses per hour would benefit from the 50% increase in green time that would revert to traffic operating on SW 27th Avenue.

4.5 North Kendall Drive and SW 127th Avenue

Figure 4-4 shows that the implementation of a grade separation along N. Kendall Drive at SW 127th Avenue will not impact circulation into or out of local streets. 900 feet west of SW 127th Avenue lies SW 132nd Avenue, which is a signalized public street on the north side of Kendall, and a private drive on the south side of Kendall. The grade separation should not affect traffic at this location, other than the intersection, itself, would need to be reconstructed to adjust the grades to accommodate the toe of the ramp. To the east of the SW 127th Avenue, there are no streets within 1,000 feet of the intersection, so the grade separation structure would not affect any local streets to the east.

Access to property east of SW 127th Avenue would be minimally impacted by the implementation of the project. On the north side of Kendall Drive is a large vacant lot with no driveways or curb cuts, so no one would have their access impacted. On the south side of Kendall Drive there are only two driveways within the 1,000 foot impacted area. A furniture store and a shopping plaza are accessed by the driveways. The driveway nearest SW 127th Avenue is about 450 east of that intersection. The driveway is signalized to allow left turns in and out of the driveway. This signalized driveway is adjacent to the only cut in the concrete median along this portion of Kendall Drive. West bound traffic wishing to access this driveway, once the structure is in place, would be required to U-turn at SW 127th Avenue.

Access to property west of SW 127th Avenue would be only slightly altered by this project. On the south side of Kendall Drive is a shopping plaza anchored by a home improvement store. This plaza is accessed by two driveways, one on Kendall Drive and one on SW 127th Avenue. There is a second driveway off of Kendall Drive that accesses the alley behind the shopping plaza. The main entrance to the plaza from Kendall Drive is right turn only because of the concrete median. Westbound traffic accessing this shopping plaza must do so from the existing entrance from SW 127th Avenue. There is also a large walled multi-family community that accesses Kendall Drive at SW 132nd Avenue, so the access to these units are not impacted in any way.

Access to the property on the northwest will be impacted. There are three driveways between SW 127th Avenue and SW 132nd Avenue, all of which access a large neighborhood shopping center. The first driveway accesses a gas station; the second driveway is the main access from Kendall Drive in to the center. There is a cut in the median to allow left turns into and out of the center at this location. The third driveway accesses the western end of the center and a fast food restaurant. There are no median cuts at either the first or third driveways, so they are right turn only. The implementation of the project would impact the ability of east bound traffic to turn left on to or off of Kendall Drive into the shopping center. However, this same traffic can access the

shopping center via a U-turn under the separation at SW 127th Avenue, or by accessing the driveway into the center off of SW 127th Avenue.

Visually, the structure will block the views of the commercial facilities on the south side of the street from west bound traffic and on the north side of the street from east bound traffic. The businesses above will all claim business damages from lack of visibility. The walled multi-family residential community turns its back to Kendall Drive and the structure would be lower than the wall in the vicinity of these units. So, it should have no visual impact on the community.

The traffic signal at SW 127th Avenue and Kendall Drive has a 2 minute and 10 second cycle. Traffic traveling on Kendall Drive has 1 minute and 20 seconds of green time and 50 seconds of red time. Left turns receive 20 seconds of the green time. Removal of the through traffic from the signal cycle will add a great deal more green time to both the left turn movements and the traffic on SW 127th Avenue. The grade separation would provide 32 minutes of additional through time for the 3,100 peak hour/peak direction through traffic on Kendall Dr.

There are two bus routes operating on Kendall Drive that could both take full advantage of the grade separation, since there is no north-south service on SW 127th Avenue, the bus stops for this area can be placed fully outside the impact area of the grade separation and be able to fully benefit from the time savings. Route 88 and the Kendall KAT , both have 10 buses per hour operating along Kendall Drive. Therefore, 20 peak hour buses would benefit from the continuous flow operations that would be achieved at this location.

Area Impacted By Structure (West Approach)

Area Impacted By Structure (East Approach)

SW 127th Avenue / North Kendall Drive

Figure No. 4-4

4.6 NW 72nd Avenue and NW 36th Street

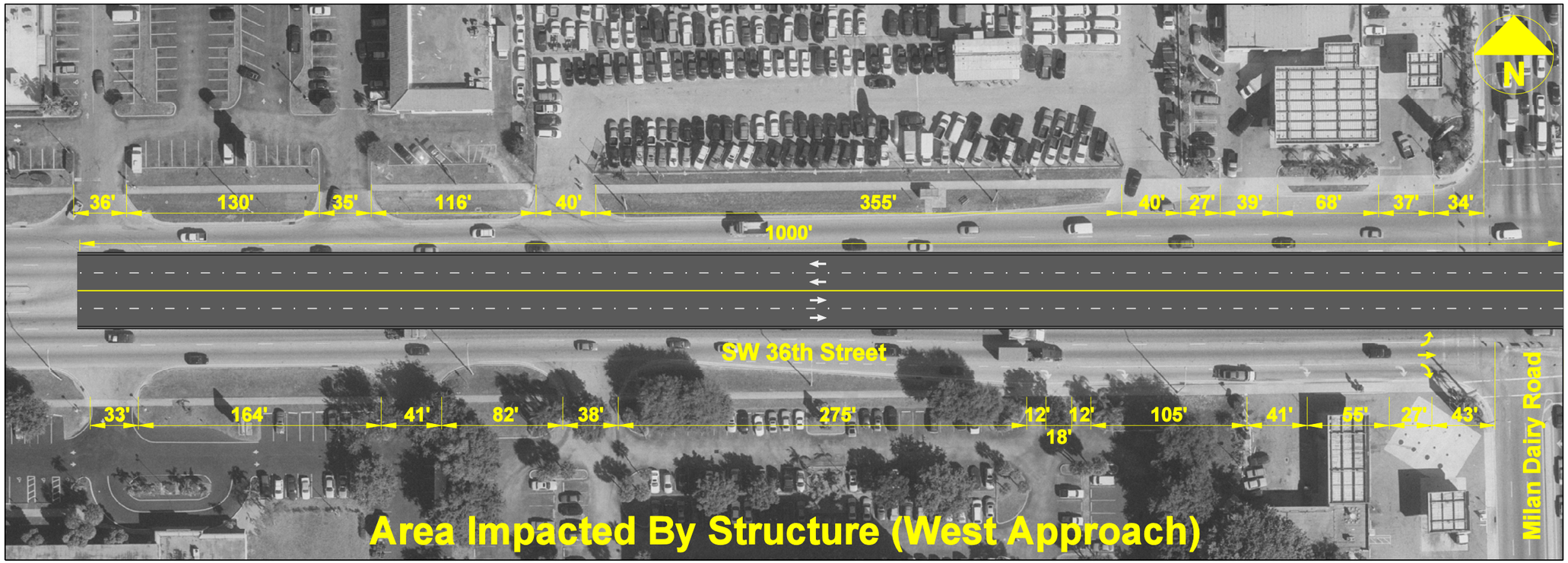
Figure 4-5 clearly shows that the implementation of a grade separation project on NW 36th Street over NW 72 Avenue would not impact any local streets, as there are not any within the 1000 foot impact area of the intersection.

This project would, however, impact access to property in the area. In the northeast quadrant of the intersection are the County jail facilities. There are no curb cuts or driveways along the north side of NW 36th Street. In the southeast quadrant are more county facilities including the jail kitchen, heavy material storage, traffic signal control center and a fire station. All of these facilities use one driveway 300 feet east of the intersection. There is a 100 foot wide break in the concrete median to allow county vehicles and fire vehicles to turn left into or out of the property. West bound traffic can still access the property via a U-turn at Milam Dairy Road. Traffic wanting to head west from the County property would have to exit onto Milam Dairy Road. The location of the Fire station at this location could be a fatal flaw if good access onto Milam Dairy Road can not be developed.

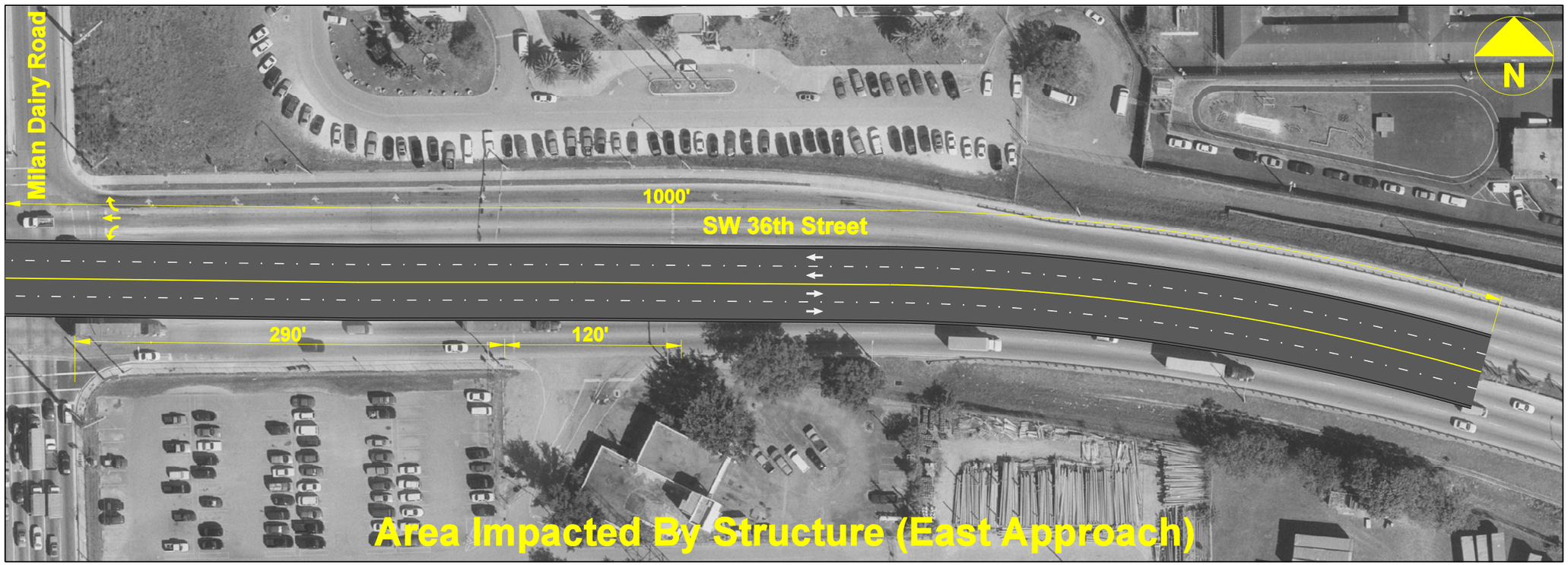
On the southwest quadrant of the intersection there are six driveways along NW 36th Street. The first two driveways access a gas station; the second two driveways access a six story office building and the last two driveways access a motel. All of the driveways except one are restricted to right turns, because of the concrete median along NW 36th Street. There is a break in the median at about 600 feet west of the intersection where left turns can be made. On the northwest quadrant six driveways along NW 36th Street provide access to three properties – a gas station, a truck dealer and a large shopping plaza. The concrete median provides the same restraints to these properties as it did for those properties on the southwest quadrant. East bound traffic will be able to access property on the north side of the street by doing a U-turn at Milam Dairy, however, west bound traffic will have to U-turn at an unprotected median opening west of the grade separation to return to the properties on the south side of the street.

Visually, the structure will block the views of the commercial facilities on the south side of the street from west bound traffic and on the north side of the street from east bound traffic. The businesses above will all claim business damages from lack of visibility.

The traffic signal at the intersection is set on a 2 minute and 45 second cycle. Traffic on NW 36th Street has 1 minute of red time, 30 seconds of left turn time and 1 minute and 15 seconds of through green time. Removal of the through traffic on NW 36th Street will provide a 1 minute 15 seconds of additional green time to the other movements in the intersection. This improvement would provide 33 minutes of additional through movement for the 2,800 peak hour/peak direction vehicles on NW 36th Street.



Area Impacted By Structure (West Approach)



Area Impacted By Structure (East Approach)

NW 36th Street / Milan Dairy Road

Figure No. 4-5

Starting 500 feet west of the intersection lies the toe of another grade separation over the FEC railroad. This existing grade separation will need to be carefully taken into account during the design of this structure to make sure the transition from one structure to the next is smooth.

There are four bus routes operating through this intersection. The Tri-Rail shuttle operates 2 buses per hour. In the east-west direction on NW 36th Street, the 95X operates one bus in the peak and Route 36 operates 10 buses per hour. In the north-south direction the 73 operates 6 buses per hour. Depending upon the location of the bus stop for Milam Dairy Road, the east-west bus routes might not benefit from the grade separation. The Tri-Rail Shuttle and the 95 X would benefit from the grade separation, but the bus stops would probably not be relocated 1000 feet away from the intersection because of the transfers between Routes 73 and 36. The 6 buses per hour in Milam Dairy would all benefit from the grade separation due to more green time per hour.

4.7 Turnpike NB On-ramp and SW 152nd Street

Figure 4-6 shows the impact of implementing a flyover project at this location. The project would extend well beyond the intersection with SW 117th Ave. The project would have little impact on the local area. A 48 foot high structure behind the houses east of the Turnpike would probably be controversial.

The flyover if it were designed on the southern edge of SW 152nd Street would have minimal impact to transit. The northeast quadrant has the SW 117th St. MDT Park n' Ride facility. The only bus route that runs through this intersection is the MDT Bus Route 252 – Coral Reef Max. This facility can only be accessed by a 30 foot driveway along 152nd St. There is a break in the center median for eastbound vehicles on SW 152nd St. that can access this facility.

A flyover designed to over cross the bridge on the Turnpike would be expensive. Given the 90 second signal cycle and the 15 second left turn signal, it is strongly recommended that a detailed traffic study be conducted at this location to retime the signal and consider restriping the paved area under the turnpike bridge to accommodate the high volume of left turn movements.

5 IMPLEMENTATION

A number of issues will be looked at for the implementation of the grade separation program around Miami-Dade County. We will examine cost of the generic grade separation, maintenance of traffic during construction, different methods of construction, schedule and construction impacts. These discussions are not site specific, they are provided to inform decision makers about the implications of implementing a grade separation project.

Grade separations can have a huge impact on the local community. It is strongly recommended that the Transportation Aesthetic Review Committee (TARC) be involved in the next stage of the process. While the separation is a great solution to traffic congestion and safety issues at intersections, the visual impact can be a negative. The TARC should be used as a tool to minimize the negative impacts of these structures.

5.1 Retained Earth Grade Separation

Table 5-1 shows the cost of constructing the standard grade separation project illustrated in Chapter 1 of this report. The cost is close to $5.5 million per project, including contingencies, design, construction management, and agency costs. The biggest variables include utilities impacts and maintenance of traffic. The estimate does not include any real estate acquisition because intersections were selected that should not need additional right-of-way. Neither does the estimate include any potential award for business damages related to loss of business due to loss of visibility from the street.

Table 5-1
Construction Cost Estimate
(2004 $)

Item	Unit	Qty	Unit Price	Total
Mobilization	LS	1	$50,000	$50,000
Maintenance of Traffic	LS	1	$150,000	$150,000
Temporary MSE Wall	SF	23,000	$11.00	$253,000
Clearing and Grubbing	LS	1	$10,000	$10,000
Roadway Fill	CY	45,000	$6.50	$292,500
Roadway Pavement	SY	16,600	$30.00	$498,000
Curb and Gutter	LF	2,500	$15.00	$37,500
Barrier Wall	LF	3,600	$95.00	$342,000
Sidewalk	SY	1,700	$25.00	$42,500
MSE Wall	SF	25,000	$25.00	$625,000
Bridge (160'X52')	SF	8,320	$150.00	$1,248,000
Drainage (20% of above)				$184,000
Lighting (10%)				$92,000
Signalization	EA	2	$120,000	$240,000

Signing and Marking (2%)				$18,000
Contingency (10% of all)				$408,290
Design and Const. Mngmt (20%)				$816,580
Agency Costs (8%)				$326,632
Total Cost				**$5,634,402**

The retained earth/cast in place can be built within a five phase maintenance of traffic (MOT) plan that involves building half of the grade separation at a time and constructing a temporary retaining structure. The entire MOT is accommodated within 120 feet of right-of-way. It is recommended that zipper lane technology be used during construction,

- Phase 1 would include all of the utility relocation and would take at least 6 months.
- Phase 2 includes night time construction of the footings, which would be covered with plates during the day. The current concrete medians would be torn out and temporary signal heads would be installed. It is estimated that it would take two weeks to close the inside lanes, shift traffic to one side, setup barricades, and temporary barrier wall and install the temporary signals.
- Phase 3 would include maintaining one lane of traffic adjacent to the curb to maintain local access. Half of the grade separation would be constructed adjacent to the single access lane. The remainder of the roadway would be marked for two-way traffic with two lanes in each direction. No left turns would be allowed during Phase 3. Traffic would not be impacted on the main cross street, except when the bridge is set in place, which would be done at night. It is estimated that it would take 6 months to construct half of the structure, the approaches and install the bridge.
- In Phase 4 one half of the traffic will already be operating as it would with the full project in place. The curb lane would provide local access to property and local streets. The next two lanes would be in operation for through traffic over the partially constructed grade separation. Adjacent to these lanes is the construction of the other half of the structure. Two lanes of traffic would be maintained adjacent to the construction area. It is estimated that it would take 6 months to construct the rest of the structure and complete the bridge.
- Phase 5 has the all of the lanes on the grade separation in operation with the only work remaining being the reconstruction of the at grade pavement on each side of the structure. This work will involve almost daily shifting of the traffic to allow local access. Work will entail, restoration of pavement, lighting, final signals, adjusting drainage, etc. It is estimated that it would take two months to finish the left turn lanes, finalize signalization, lighting, pavement markings, and signing.

The complete construction of the grade separation while maintaining traffic operations through the intersection will take at least 26 months.

5.2 Precast Grade Separation

An alternate method of constructing the grade separation would be to install a precast segmental bridge from approach to approach. The total bridge length would be about 1,600 feet. The use of precast segments instead of retaining walls and embankment will

save a significant amount of time. This design will also provide for the option of a left turn lane under the bridge, facilitating the local access movements that are kept at-grade. It is recommended that zipper lane technology be used during construction.

Phase 1 of the project would entail the night time construction of spread footings. During the day steel plates would be installed over the footing construction to allow traffic operation during the day.

Phase 2 of the project entails the off-site fabrication of the steel girders, precast piers, precast segmental sections, and the prefabrication of all other items necessary to assemble the bridge. This Phase can be concurrent with phase 1. When the footings are complete the contractor can move all of the prefabricated items to a location near the site.

Phase 3 of the project could be done at night putting in place the piers and the segmental box sections. Even allowing night work parts of the intersection would need to be closed for about a month while the segmental box is being installed.

This is by far the fastest construction method, causing the least impact to traffic. This alternative can be built in 14 to 15 months. It is estimated that this bridge would cost 2.5 times the cost of the retained earth grade separation or about $14 million dollars.

5.3 Depressed Open Cut Construction

Another method of providing a grade separation is to construct a depressed open section and a bridge for the cross street. This alternative would be very costly due to dewatering. A five foot deep concrete slab would be necessary to keep the water from entering the roadway. The depressed section will also require the construction of water proof retaining walls on either side of the street to construct this cross section.

The expected construction cost should be about $35 million and it would require the closure of the intersection for at least one year. It should be assumed that the total project would take up to 36 months to construct. Since there is no previous history of this type of construction in South Florida, these estimates are based upon the construction documents for a similar project that is currently out to bid.

5.4 Recommendations

5.4.1 Construction Type

The brief examination of construction type shows that the precast bridge-type grade separation is the preferable type of facility to pursue for three reasons:

1. Shorter construction time (almost half the length of time)
2. Fewer construction impacts (far less utility impacts as the piers can be designed to miss utilities, where as the footings for the wall will hit every perpendicular utility)
3. Accommodates separate left turn lane, thus improving all of the non-grade separated movements.

5.4.2 Level of Service

All of the Tier 2 alternative intersections operate at a level of service E or F. Table 5-2 provides the LOS analysis for each alternative. First FDOT typical urban intersection percentages were used to reduce 24-hour data to peak hour and peak direction through volumes. Estimated through volumes were then compared to actual signal timing information. Signal timing is not a fixed item and can be modified. The length of the cycle at the time of the assessment had a major impact on the results of the analysis.

Table 5-2
Intersection Analysis

	SW 8 St. / 107 Ave	SW 8 St. / 87 Ave	NW 36 St/ 72 Ave	Kendall Dr/ SW 127 Ave	US 1/ SW 27 Ave
Volume	54,000	58,000	62,500	69,500	101,500
Peak Hour	5,130	5,510	5,937	6,602	9,642
Peak Direction	2,821	3,030	3,265	3,631	5,303
Through	2,482	2,666	2,873	3,195	4,666
LOS	E	E	E	F	F
Posted Speed	40 MPH/ 45 MPH	40 MPH/ 45 MPH	40 MPH/ 45 MPH	45 MPH/ 35 MPH	45 MPH/ 30 MPH
Speed	16 MPH	16 MPH	16 MPH	16 MPH	16 MPH
Cycle Length	120 sec.	120 sec	165 sec	130 sec	120 sec.
Cycles/hour	30	30	22	28	30
Green Ratio	29%	37%	45%	55%	58%
Vehicles Held at Red	1,762	1,679	1,580	1,437	1,959
Additional flow /Hr	42.5 min.	37.5 min.	32.7 min.	32 min	25.1 min
Driver savings *	150,122 sec.	126,932 sec.	143,385 sec	84,064 sec.	98,733 sec.

*Driver savings is equal to the number of vehicles held at red times the length of red time in seconds.

Arterial level of service would improve very little with the construction of a single grade separation; however delay on the arterial would certainly decrease. The intersection level of service would certainly increase to B or A in almost every circumstance. A critical aspect of the next phase of this study will be a detailed traffic analysis of each intersection recommended for improvements. Unfortunately traffic counts and speed studies were not a part of this initial countywide assessment.

Of the five intersections, the greatest benefit can be gained by from the intersections in this order.

1. SW 8th Street across SW 107th Avenue;
2. NW 36th Street across NW 72nd Avenue;
3. SW 8th Street across SW 87th Avenue;

4. US 1 across SW 27th Avenue, and
5. N. Kendall Drive across SW 127th Avenue.

It should be noted that this order of implementation reflects improvement to traffic flow, but would be nearly identical if the ranking were based upon ease of implementation or neighborhood impacts.

The final recommendation is that all five projects should be moved forward for more detailed analysis.